





FLORA OF THE USSR

Volume XXIX

COMPOSITAE

Tribe Cichorieae

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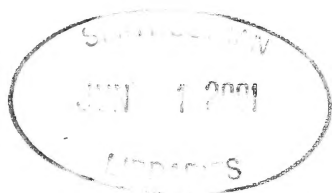
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Tribe Cichorieae



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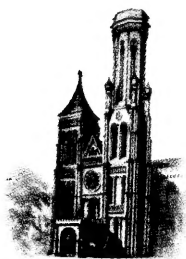
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XXIX

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SCIENTIFIC EDITOR'S PREFACE

This is the fifth volume of six (Vols. XXV–XXX) that treat the large family Compositae (Asteraceae). Throughout this volume, as in the other volumes on this family, the translators have used the Latin term "capitulum" (pl., capitula), instead of the more familiar English term "head," for the Russian term denoting the primary inflorescence of florets. "Head," if it is used, denotes a secondary inflorescence, i.e., an arrangement of capitula.

For practical reasons, I have concentrated my editorial review of this volume on the keys, discussions, and habitat and distribution statements. Every page of the translation has been reviewed also by either Dr. Fet or Ms. Unumb. Dr. Fet has paid particular attention to the geographic and place-name terminology in the distribution statements following the morphological descriptions. We are confident of the accuracy of the translation but also recognize that there will be imperfections.

February 1998

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PREFACE

The twenty-ninth volume contains descriptions of 595 species belonging to 45 genera of the subfamily Cichorioideae. The sequence of genera in this volume, unlike in earlier volumes of the Asteraceae (Compositae), corresponds to the new system proposed by George Ledyard Stebbins (1953), which includes some significant changes.

This volume completes the publication of the *Flora of the USSR*, as Volume XXX was published earlier.

Now we know that the Soviet flora comprises 17,520 species belonging to 1,676 genera of 160 families.

These figures are, however, approximate. This is because inclusion of the plants from the Soviet Baltic Republics and the western regions of Belorussia, Ukraine and Moldavia in the *Flora of the USSR* only began with volumes XI–XII. Inclusion of the plants of the Kaliningrad Region, Karelian Isthmus and Transcarpathia, as well as southern Sakhalin, the Kuril Islands and Tuva, began still later, with volumes XIV–XV.

Thus, we see that the *Flora of the USSR* has become outdated to a certain extent with the expansion of the territory of the Soviet Union. It has also become outdated because the publication of each volume has greatly facilitated the collection of new facts.

However, only the prewar volumes published during the 1930s have become significantly outdated. Some of them need revision, which if undertaken would herald the beginning of a new series of the *Flora of the USSR*.

Nevertheless, with the completion of the present series of the *Flora of the USSR*, we can say that now we know quite well the indigenous flora in general terms.

This publication will continue to serve for the next few decades as a general manual for the identification of the higher plants of this country and as the foundation of our knowledge of the wild indigenous species.

The fact that the territory of the Soviet Union covered by the *Flora of the USSR* constitutes one-fifth of the total land area of the earth, including a large part of the boreal and temperate zones of the northern hemisphere, imparts great international significance to this publication.

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Volume XXX, published earlier, contains genus 1676, *Hieracium* L., with 785 species. Thus, the *Flora of the USSR* comprises 160 families, 1,676 genera, and 17,520 species of vascular plants.

- 1 Subfamily **II. CICHORIOIDEAE** Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XIII (1937) 4 (Compos. Jap. I) and Ibid. XXII, 1 (1955) 77 (Compos. Jap. IV).—Cl. Syngenesia: *Polygamia aequalis* L. Sp. pl. (1753) 789, p. p.—Semiflosculosae Berkh. Expos. charact. struct. Compos. (1760) 6.—Cl. Compositae ordo 1. Compositae semiflosculosae P.F. Gmel. Otia bot. (1760) 122.—Compositae sect. Lactuceae Adans. Fam. pl. II (1763) 111.—Cl. Ligulatae Hill, Hort. Kew. (1769) 39.—Chicoraceae Neck. in Acta Acad. Theod.-palat. II (1770) 463.—Cichoraceae Juss. Gen. pl. (1789) 168 (pro ord.); Link, Handb. I (1829) 779; D. Don in Edinb. New Philos. Journ. VI (1829) 305–306 (pro fam.).—Cichoriaceae Juss. l. c. nom. fam. conserv.—Glossariphytum Neck. Elem. bot. I (1790) 44.—Compositiflorae Ligulatae Gaertn. De fruct. et sem. pl. (1791) 353.—Symphianthera. Flores compositi corollulis omnibus ligulatis Moench, Meth. (1794) 30, 532.—Cl. Compositae Fam. I. Semiflosculosae Batsch, Tab. affinit. regni veget. (1802) 250.—Chicoracées ou Semiflosculosos DC. in Ann. Mus. Hist. Nat. XVI (1810) 145.—Lactucées ou Chicoracées Cass. in Nouv. Bull. Sci. Soc. Philom. Paris (1812) 189.—Compositae, Ordnung V. Cichoreae Spreng. Anleit. ed. 2, II (1818) 577.—Stirps Flosculacia ordo Ligulacia [fam.] Chicoraceae Dum. Comment. bot. (1822) 55.—Compositae A. Homoianthae a. Lactuceae Rchb. Consp. regni veget. (1828) 97.—Cl. Compositae, ordo Synanthereae XX. Lactuceae Bartl. Ordin. natur. pl. (1830) 145.—Compositae D. Homoianthae a. Cichoriaceae Rchb. Fl. germ. exc. (1831) 248.—Compositae subordo Liguliflorae DC. Prodr. V (1836) 9 and Ibid. VII, 1 (1838) 74.—Compositae C. Homoianthae a. Liguliflorae 1. Cichorieae Rchb. Repert. herb. sive Nomencl. (1841) 94.—Compositae **B. Liguliflorae** O. Hoffm. Nat. Pflanzenfam. IV, 5 (1893) 350.—Lactucaceae Bessey in Ann. Missouri Bot. Garden 2 (1915) 164 (pro fam.).—Lactucoideae Solbrig in Taxon. XII, 6 (1963) 230.—All florets ligulate. Ligules five-toothed at apex, yellow or, less often, with other colors (light blue, lilac, etc.). Pollen grains predominantly spiny-cristate (echinulate). Plants almost always with latex contained in more or less welldeveloped system of anastomosing laticifers. Leaves alternate, only rarely opposite; often arranged in basal rosette.

Type of subfamily: *Cichorium* L.

KEY TO GENERA OF TRIBE CICHORIOIDEAE¹

1. Receptacle densely covered with coriaceous or cartilaginous-coriaceous floral scales, enclosing achenes and deciduous with latter. Capitula surrounded by spiny bracteal leaves. Strongly prickly annual or biennial plants of Taman peninsula, Crimea, and Transcaucasia 1631. **Scolymus** L.
- + Receptacle without coriaceous floral scales. Capitula not surrounded by spiny bracteal leaves. 2.
2. All achenes, or (less often) at least some, with distinct pappus ("letuchka") of simple or plumose hairs (bristles). 12.
- + Achenes entirely without pappus or latter coronate (i.e. as short membranous, toothed, ciliate or fimbriate crown); sometimes, but only inner, achenes with short pappus of barbed (less often membranous, broadened at base) hairs (bristles) 3.
3. All achenes without pappus as well as beak; only sometimes with slightly raised, scarcely toothed, and membranous frill, but then stems below capitula hollow, distinctly clavately swollen 4.
- + Achenes with at least very short but quite distinct pappus 7.
4. Achenes 8–15 mm long. Inner involucre bracts (much longer than outer ones) enlarged on fruiting, hardened and enclosing peripheral stellate-flattened achenes 1647. **Rhagadiolus** Scop.
- + Achenes shorter, mostly up to 5 mm long. Inner involucre bracts not enlarged on fruiting 5.
5. Plants with more or less numerous small capitula on slender peduncles, forming cymose or paniculate general inflorescences. Achenes with numerous (about 20) fine ribs 1665. **Lapsana** L.
- + Plants scapose bearing solitary terminal capitula, or stems slightly broadened, but then latter clavately swollen below capitulum... 6.
6. Perennial, with pinnatifid or pectinately parted rosulate leaves. Achenes 4–5 mm long, indistinctly tetra- or pentamerous 1666. **Aposeris** Neck.
- + Annual, with more or less distinctly sinuate-toothed, oblong-obovate, rosulate leaves. Achenes 1.5–2 mm long. 1633. **Arnoseries** Gaertn.
- 7(3) Inner involucre bracts with fruits thickened and hardened, sometimes compactly fused with each other 8.
- 3 + Inner involucre bracts remaining unchanged with fruits, herbaceous (if so, sometimes connate at base) or thin-coriaceous 10.

¹Treatment by M.E. Kirpicznikov.

8. Inner involucre bracts with fruits connate into hard shell-like cover, open on top (only apices free and foliaceous). Capitula pyriform-globose, small 1672. **Acanthocephalus** Kar. and Kir.
- + Inner involucre bracts with fruits not connate 9.
9. All achenes without beak, peripheral with coronate and toothed pappus, inner ones with pappus of membranous bristles. Ligulate florets exceeding involucre. Plants of the Caucasus, less often in Crimea 1645. **Hedypnois** Schreb.
- + All or some achenes with beak or at least apically produced; pappus of short bristles or coronate—fimbriate or fimbriate-ciliate. Ligulate florets slightly longer than involucre. Plants of Soviet Central Asia and the Caucasus 1646. **Garhadiolus** Jaub. and Sp.
- 10(7) Ligules mostly light blue, blue or bluish-pink, sometimes (in albinos) whitish. Receptacles with short split scales. Involucre more or less cylindrical. Pappus coronate, very short (only 0.2–0.8 mm long), of small-toothed scales 1632. **Cichorium** L.
- + Ligules yellow or light yellow (turning pale or sometimes blue on drying). Receptacle glabrous or with few bristles. Capitula with fruits hemispherical. Annuals 11.
11. Basal leaves more or less crenate-dentate to pinnatifid and pinnatifid, oblong or oblong-obovate; cauline leaves sessile, amplexicaul or semiamplexicaul, with sagittate base. Outer achenes persistent, inner deciduous 1671. **Heteracia** Fisch. and Mey.
- + All leaves entire, mostly linear-filiform or linear, less often narrowly oblong or lanceolate, not amplexicaul. All achenes deciduous 1634. **Koelpinia** Pall.
- 12(2) Inner involucre bracts with fruits indurate and swollen in form of hood, compactly enclosing outer achenes by their margins; latter with beak, inner achenes without beak. Annuals with yellow ligules; in the USSR found only in Crimea...1675. **Zacintha** Mill.
- + Inner involucre bracts with fruits not indurate and not swollen.. 13.
13. All or at least one row of pappus hairs (bristles) plumose 14.
- 4 + Pappus hairs simple or somewhat barbed 23.
14. Involucre one-rowed 15.
- + Involucre two-rowed or imbricate 17.
15. Beak at base (at articulation with achene) hollow, swollen, attached to achene at an angle. Pappus of one row of easily detaching white plumose hairs, as long as beak. Involucre of eight foliaceous bracts, coronate below. Annual, with yellow ligules 1644. **Urospermum** Scop.

- + Beak, if present, not swollen at base. All other characters different 16.
- 16. All achenes with pappus of similar hairs. Receptacle without scales. Perennials or biennials. 1637. **Tragopogon** L.
 - + Pappus of achenes dissimilar; in peripheral achenes with five protruding, scabrous, persistent bristles, pappus hairs soft in inner achenes. Receptacle fimbriate-villous. Annual 1638. **Geropogon** L.
- 17(14) Receptacle with long scarious scales, exceeding achenes 18.
 - + Receptacle glabrous, less often pubescent or with short scaly or fimbriate scales 19.
- 18. Pappus two-rowed: hairs of outer row short, almost filiform; hairs of inner row long, plumose. Scarious scales on receptacle not overlapping. Growing in European part of the USSR (excluding Crimea) and the Caucasus 1639. **Hypochaeris** L.
 - + Pappus one-rowed. Scales on receptacle arranged longitudinally. Perennials with rosette of rather large basal leaves, found in the European part of the USSR (excluding Crimea), Caucasus, and Siberia, less often in the Far East 1640. **Achyrophorus** Scop.
- 19(17) Pappus hairs entangled (plumose parts of adjacent hairs entwined), soft 20.
 - + Pappus hairs free, not entangled 21.
- 20 Achenes with callous annulus at apex or near midpoint; in latter case, upper part of achene covered with woolly hairs merging into pappus. Annuals 1636. **Epilasia** Bge.
 - + Achenes without callous annulus, glabrous or pubescent, at base sometimes with hollow appendage (pedicel; if so, leaves usually pinnatisect). Perennials 1635. **Scorzonera** L.
- 5 21(19) Outer involucre bracts three to five (six), relatively broad (resembling small leaves in form) and inner row of narrowly linear, long, cuneately acuminate bracts (usually eight). Achenes with fragile filiform beak, patelliform above, bearing persistent one-rowed pappus. Annual weed, with stem, leaves, and capitula covered with stiff hairs. Found in Crimea and Caucasus (and in Turkmenia?—introduced) 1643. **Helminthia** Juss.
 - + Outer involucre bracts absent. Combination of other characters different 22.
- 22. Pappus two-rowed: inner row of basally fused plumose hairs. Stem branched, leafy, mostly without rosette of basal leaves (with exception of *Picris rigida* Ldb.) 1642. **Picris** L.
 - + Pappus one- or two-rowed, its hairs not fused at base. Stem mostly scapose or weakly branched, with one or two or several small linear leaves. Lower leaves in basal rosette 1641. **Leontodon** L.

- 23(13) Receptacle with less numerous setiform scales much longer than achenes 1674. **Lagoseris** M.B.
 + Receptacle mostly glabrous, smooth to pitted or alveolate, with scaly margins; very rarely short ciliate or fimbriate, but always without setiform scales 24.
24. Stem leafless (scapose), almost always hollow (only in very rare cases stem weakly branched, and then capitula two or several), terminating in single apical capitulum. Perennial with basal leaves arranged in rosette 25.
 + Stem leafy, almost always more or less strongly branched; capitula very rarely one or several, usually more or less numerous, in corymbose, corymbose-paniculate, paniculate (less often racemose or other type) general inflorescence 26.
25. Involucre mostly two-rowed (less often incompletely three-rowed). Plants with slender creeping rhizome, at places tuberos. Achenes with 2–2.5 mm long flattened part and beak about four times as long, with crown of five (six) short, apically roundish scales at conically broadened base. Within the USSR, growing only in Caucasus 1669. **Willemetia** Neck.
 + Involucre of several rows of bracts. Plants mostly with cord-like root. Combination of remaining characters different. Genus with species distributed throughout the USSR
 1667. **Taraxacum** Wigg.
- 26(24) Achenes heterogenous: outer achenes few, subtended by inner involucre bracts, without or with very short beak and easily detaching pappus; inner achenes numerous, prismatic, apex sharply tuberculate, with beak and persistent pappus, beak two times as long as body of achene. Annual herbs with few-flowered capitula and rosette of basal leaves. Found in Soviet Central Asia
 1670. **Heteroderis** (Bge.) Boiss.
- 6
 + Achenes all alike; if different, then inner and outer achenes differing from each other in various characters 27.
27. Body of all or only inner achenes tuberculate or with various types of scales along ribs, especially at apex (or simultaneously with tubercles and scales). Beak often articulated, breaking easily at articulation with pappus, or without articulation, but then almost always clavately thickened at apex. Sometimes achenes smooth or almost so, but then with crown of five short scales at apex, and distinctly articulated beak. Very rarely even crown absent (or almost indistinct), but then involucre bracts and flowers in capitulum five each, and plant with thick, flexuous stem, often divaricately branched. Perennials, less often biennials
 1668. **Chondrilla** L.

- + Achenes without tubercles and scales; combination of remaining characters different 28.
- 28. Completely glabrous herb with prostrate branches, rooting at nodes; lamina divided into three to five almost palmate segments. Achenes with rather thick porous pericarp. Perennials. Found in the Far East 1663. **Chorisia** DC.
- + Plants more or less pubescent; if glabrous, not rooting at nodes. Remaining characters also different 29.
- 29. Achenes heteromorphic, at least peripheral ones appreciably different from inner ones in form, nature of pubescence, or in other characters; occasionally some achenes with pappus, and others without it 30.
- + Achenes homomorphic, i.e., all achenes in capitulum practically similar 36.
- 30. Inner hairs of pappus relatively thick and long, less numerous (five to nine); outer hairs more numerous, short, soft and silky. Achenes 10–12 mm long, narrowly cylindrical (columnar). Plants endemic to Soviet Central Asia 1649. **Rhabdotheca** Cass.
- + Pappus (sometimes present only in some achenes) hairs similar in thickness. Achenes smaller or of different form 31.
- 7 31. Outer achenes prismatic or columnar, tetra- or pentaquetrous, dark brown, with four to five longitudinal furrows, transversely tuberculate. Flowers in capitulum (35)50–70(100). Perennials, growing in the Caucasus 1652. **Reichardia** Roth
- + Outer achenes of different form. Flowers in capitulum almost always not many 32.
- 32. Highly branched perennial or semishrub with hard, prickly, terminal branches. Leaves dropping off early, older plants becoming leafless, virgate. Capitula 5–6(10)-flowered, solitary or (less often) from two to a few, mostly on secondary branches. Endemic to Turkmenia 1650. **Atalanthus** D. Don
- + Annual or perennial herbs without prickly terminal branches. Remaining characters different 33.
- 33. Pappus about three times as long as achenes, of very fine and silky white hairs connate at base into small ring. Outer achenes with rather numerous prominent, longitudinal, tuberculate-rugose ribs, narrowed toward apex, and terminating in very small, readily detaching beak. Plants growing in Soviet Central Asia 1643. **Paramicrorhynchus** Kirp
- + Pappus shorter than achene, as long or sometimes slightly longer. Remaining characters different 34.
- 34. Capitula few-flowered, only four to six flowers in each. Outer achenes with uncinatate outgrowths, densely covered, as also entire

- achene, with very short distant hairs (seen under hand lens!); inner achenes more or less glabrous. Annual, endemic to deserts of Soviet Central Asia 1660. **Lagoseriopsis** Kirp.
- + Capitula usually many-flowered 35.
35. Corolla tube 2–3 mm long, densely villose. Inner achenes 3.5–5(6) mm long 1673. **Crepis** L. [sect. *Phaecasium* (Cass.) DC.]
- + Corolla tube 4–6(8) mm long, with scattered short, needle-shaped hairs or almost glabrous. Inner achenes (including beak) 9–18 mm long 1673. **Crepis** L. [sect. *Barkhausia* (Moench) Gaudin]
- 36(29) Involucre of only one row of well developed bracts. Capitula few-flowered, each with three to five yellow flowers. Herbs with short rhizome, growing in the European part of the USSR and Caucasus 1657. **Mycelis** Cass.
- + Involucre of two or more distinct rows of bracts; if one-rowed, flowers in capitulum at least eight 37.
37. Pappus of outer crown of short, light colored hairs (seen under hand lens!), and inner row of well developed hairs; sometimes outer crown indistinct but then achenes flattened, (1.5)2–3 mm wide, with beak, or achenes slightly flattened, with small dark spots (seen under hand lens!) also on narrowed apex 38.
- 8 + Outer crown of short hairs absent; all pappus hairs more or less similar; achenes almost always narrower, or without beak and purple spots 40.
38. Achenes with well-developed slender beak 39.
- + Achenes without beak; their apex with either short, wide, somewhat deep constriction, or wide neck. 1659. **Cicerbita** Wallr.
39. Achenes (1.5)2–3 mm wide, slightly to strongly flattened, with one or few (mostly up to three) prominent longitudinal ribs 1656. **Steptorhamphus** Bge.
- + Achenes up to 1 mm wide, fusiform, with more or less numerous prominent longitudinal ribs. Beak differing in color from body of achene 1658. **Cephalorrhynchus** Boiss.
- 40(37) Cauline leaves long, linear, decurrent on internodes and attached to stem by their bases (auricles) in form of prominent green stripes on lighter-colored stem. Capitula few-flowered, mostly with five flowers each 1655. **Scariola** F.W. Schmidt
- + Cauline leaves attached to stem without bases 41.
41. Lower leaves narrowed into winged petiole, with broad scarious base, along margin and inward mostly covered with papillate and stellate hairs. Plants endemic to Darvaz 1655. **Scariola** F.W. Schmidt
- + Lower leaves different 42.
42. Achenes strongly flattened, almost black, elliptical or oblong-

- elliptical, in broadest part (1.5)2–2.5 mm wide, with one or a few prominent longitudinal ribs, beak very short or absent, apex with wide collar. Biennial or perennial, mostly with underground narrow-fusiform thickenings, growing almost exclusively in the Far East, less often in Eastern Siberia 1654. **Lactuca** L. (subgenus *Pterachenium* (Kitam.) Kirp.)
- + Achenes not or only slightly flattened or differently colored and narrower; remaining characters different 43.
 - 43. Achenes without beak or with beak-like tip, only sometimes slightly narrowed toward apex 44.
 - + Achenes with more or less distinct beak, usually differing in structure and color from body, (beak sometimes very short—visible under hand lens!), or achenes narrowed into beak-like tip, mostly pale in color, less often lighter 49.
 - 9 44. Ligules light blue, blue or lilac; capitula with 15–20(25) flowers each. Leaves lanceolate or oblong-lanceolate. Weeds or semiweeds 1654. **Lactuca** L. (subgenus *Mulgedium* (Cass.) Bab., Stebb. and Jenk.).
 - + Ligules yellow; if light blue-lilac, then number of flowers in capitulum or shape of leaves different 45.
 - 45. Fully developed capitula with 75 or more flowers each; ligules yellow; achenes somewhat to strongly flattened, ovoid, oblong, obovoid, or less often more or less prismatic. Pappus hairs smooth or almost so 1651. **Sonchus** L.
 - + Flowers in each capitulum fewer and if with same number, achenes or pappus different 46.
 - 46. Capitula with 9–15 flowers each and yellow ligules, often turning pink after flowering. Achenes somewhat flattened, with ribs of different thickness. Outer as well as inner involucre bracts with distinct, narrow, bent cornicle on outer side 1661. **Youngia** Cass.
 - + Capitula with larger number of flowers, if flower as many or less, their ligules colored otherwise or achenes of different shape 47.
 - 47. Achenes fusiform, narrowed toward apex, with 10 or more longitudinal ribs. Pappus of white or whitish hairs. Capitula many-flowered; ligules almost always yellow 1653. **Prenanthes** L.
 - + Achenes not narrowed toward apex, cylindrical, prismatic, oblong-linear or linear 48.
 - 48. Achenes oblong-linear or linear, somewhat flattened or less often almost cylindrical, with faint striations or with more or less distinct longitudinal four to five, less often more ribs. Pappus of numerous dirty brown or light rust-colored, less often white hairs.

- Flowers in each capitulum 5, 8–10, 15 or 25–35 1653. **Prenanthes** L.
- + Achenes cylindrical or prismatic, truncate (and not narrowed as in *Crepis*; cf. couplet 47), mostly with 10 longitudinal ribs. Pappus almost always of stiff, bristly, yellowish or dirty white hairs, extremely rarely of white flexible hairs. Flowers in capitulum mostly numerous, very rarely 20–45 **Hieracium** L.¹
- 49(43) Beak or beak-like tip shorter than body of achene 50.
- 10 + Beak or beak-like tip more or less as long as body of achene, often much longer. Plants usually more or less pubescent 52.
50. Plants glabrous, growing in the Far East, and less often also in eastern Siberia 51.
- + Plants pubescent. Annuals, growing in the European part of the USSR (including Crimea) and in Caucasus 1673. **Crepis** L. (sect. *Nemauchenses* (Cass.) Benth.)
51. Pappus hairs persistent, up to 3.5–7.0 mm long. Perennials, usually with persistent basal leaves and a few cauline leaves 1662. **Ixeridium** (A. Gray) Tzvel.
- + Pappus hairs readily detaching; achenes 2.5–3.5 mm long. Annuals and biennials with early-withering basal leaves, but with numerous cauline leaves 1664. **Paraixeris** Nakai
- 52(49) Capitula many-flowered (with more than 25 flowers each). Achenes fusiform, narrowed toward base, with 10 longitudinal puberulent ribs (seen under high magnification). Pubescent biennials with woody vertical root, found in Crimea and Caucasus. 1673. **Crepis** L. (sect. *Lepidoseris* (Rchb.) Bab.)
- + Capitula (8)10–20(25)-flowered. Achenes more or less distinctly to strongly flattened, narrow-obovoid or oblong-ellipsoidal, with rather numerous or less often only one to three longitudinal ribs; achenes puberulent along ribs (seen under hand lens!), and between them (seen under high magnification), usually in transverse flexuous rows 1654. **Lactuca** L. (subgenus *Lactuca*).

Tribe 14. CICHORIEAE Spreng. Syst. Veget. III (1826) 633 ("Cichoreae"; pro tribu e cl. Syngenesiae).—Lactuceae Cass.¹ in Bull.

¹The descriptions of *Hieracium* L. species occupy a separate volume published earlier. Cf. the *Flora of the USSR*, Vol. 30, Izd. Akad. Nauk SSSR, Moscow-Leningrad, 1960.

- Soc. Philom. (1815) 173, in Journ. Phys. (1819) 151 (non vidi) and in Dict. sc. nat. XX (1821) 355, XXV (1822) 59, XLVIII (1827) 422 (pro tribu Synantherearum); Dum. Fl. Belg. (1827) 59.—Trib. Cichorieae Dum. Analyse fam. pl. (1829).—Cichoraceae Less. in Linnaea V (1830) 132 and in Synops. Compos. (1832) 126 (pro tribu Synantherearum);
 11 DC. Prodr. VII, 1 (1838) 74 (pro tribu Compositarum).—Nexus Compositae 1. Synanthereae, trib. Liguliflorae Griseb. Grundr. system. Bot. (1854) 136.—Trib. Cichoriaceae (Juss.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 219.—[Trib.] Cichorieae Baill. Hist. pl. VIII (1882) 70, 105.—Trib. Cichorieae Rchb. ex O. Hoffm. in Engl. and Prantl. Nat. Pflanzenfam. IV, 5 (1893) 350.—The description of the tribe corresponds to the characterization of the subfamily.

Type of tribe: type of subfamily.

Subtribe 1. **SCOLYMINAE** Less. Synops. Compos. (1832) 126 ("Scolymeae"); DC. Prodr. VII, 1 (1838) 75; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 219; O. Hoffm. in Engl. and Prantl. Nat. Pflanzenfam. IV, 5 (1893) 353; Stebbins in Madrono XII, 3 (1953) 70.—Trib. Lactuceae sect. 1. Archetypae Cass. in Dict. sc. nat. XXV (1822) 60, p. min. p.—Trib. Lactucées sect. 1. Prototypes 1. Scolymées Cass. in Dict. sc. nat. XLVIII (1827) 422.—Trib. Cichoreae D. Don in Edinb. New Philos. Journ. VI (1829) 307. p. p. (solum gen. *Scolymus*).—Trib. Cichorieae g) Scolymeae Dum. Analyse fam. pl. (1829) 30.—Pappus coronate, only sometimes corona with a few long scabrous bristles. Pollen grains spiny-cristate (echinulate). Receptacle with coriaceous or cartilaginous-coriaceous scales enclosing achene from sides and falling with it. Basic chromosome number: $x = 10$.

Type of subtribe: *Scolymus* L.

GENUS 1631. *Scolymus* L.^{1, 2}

L. Sp. pl. (1753) 813.—*Myscolus* Cass. in Bull. Soc. Philom. (1818) 33.
 Capitula usually rather numerous, less often (in very small

¹Classifications of the Lactuceae were published twice by A. Cassini: first in 1822 (in Dict. sc. nat. XXV, pp. 59–89), when a brilliant treatment of this group of the Compositae [Asteraceae] was given after the list of genera; in 1827, A. Cassini (in Dict. sc. nat. XLVIII, pp. 421–435) slightly modified and supplemented the classification of the Lactuceae. The latest publications of his classification (in Dict. sc. nat. LX, 1830, pp. 568–569; in Opusc. phytol. III, 1834, pp. 44–46) repeated the classification published in 1827 and, therefore, are not cited by us.

- specimens) solitary, terminal on stems and lateral branches, and sessile or almost sessile in axils of upper cauline leaves, enclosed by two to six spiny terminal leaves, homogamous, with rather numerous (15–40) bisexual ligulate florets. Involucre ovate, 12–16 mm long and 4–7 mm wide, consisting of a few irregular rows of imbricate, coriaceous-herbaceous, lanceolate or lanceolate-linear bracts, gradually increasing in length from outer to inner. Receptacle obtusely conical, densely covered with ovate (from oblong-ovate outer to broadly ovate inner) coriaceous or cartilaginous-coriaceous, 4–8 mm long scales; bracts on inner (ventral) side with two longitudinal folds, enclosing ovary and achene on sides and falling with achene. Flowers yellow or light yellow, usually almost one and one-half times as long as involucre; corolla 12–12.5 mm long, with four or five rather long teeth at apex and more or less hairy tube. Anthers sagittate at base, and with rounded triangular appendage at apex. Style branches relatively short, almost filiform. Achenes 2–4 mm long, oblong, strongly flattened dorsally, with five longitudinal ribs, of which two lateral ribs very prominent, and ventral and two dorsal ones significantly weak, glabrous, tip with short (0.2–0.7 mm long) irregularly toothed crown and two long and scabrous barbed bristles from its base, or only with crown without bristles; achenes on all sides (with exception of their tip with crown) firmly enclosed by bracts and their longitudinal folds, falling together with them. Annual or biennial herbs with more or less branched erect stems and more or less crenate-dentate or pinnatipartite highly spiny, sessile, decurrent cauline leaves.

Type of genus: *S. maculatus* L.

Three species of the genus are represented in the Mediterranean Region, from the Pyrenees and North Africa to the Caucasus. Of these, two species are found in the USSR.

- 1 Capitula mostly in axils of middle and upper cauline leaves and usually surrounded by three leaves (one sheathing and two lateral); leaf margin not or scarcely thickened; achenes with crown and two long bristles at tip 1. ***S. hispanicus* L.**
- + Capitula predominantly terminal on stem and lateral branches, usually enclosed by four to six terminal leaves; leaf margin with

¹Treatment by N.N. Tzvelev.

²Latin transcription of the Greek name of the plant—*skolymos*, originating from the word *skolos*—spine or thorn.

moniliform thickening; achenes with only crown at tip, without bristles. 2. *S. maculatus* L.

Section 1. *Myscolus* (Cass.) DC. Prodr. VII (1838) 76.—*Myscolus* Cass. in Bull. Soc. Philom. (1818) 33 and in Dict. sc. nat. XXIV (1825) 83.—Achenes with crown and two long bristles at tip; capitula predominantly axillary.

Type of section: *S. hispanicus* L.

1. ***S. hispanicus*** L. Sp. pl. (1753) 813; M.B. Fl. taur.-cauc. II, 262; DC Prodr. VII, 76; Ldb. Fl. Ross. II, 770; Boiss. Fl. or. III, 713; Schmalh. Fl. II, 132; Grossh. Fl. Kavk. IV (1934) 223 and Oprel. Rast. Kavk. (1949) 502; Stank. and Tal. Oprel. Vyssh. Rast. (1949) 681; Kuthath. in Fl. Gruzii VIII (1952) 595.—*Myscolus microcephalus* Cass. in Dict. sc. nat. XXXIV (1825) 85.—*M. hispanicus* (L.) Dietr. Synops. pl. IV (1839–1852) 1333.—**IC.**: Rchb. Ic. Fl. Germ. XIX (1858) t. 1352; Jav. and Csap. Ic. Fl. Hung. (1933) 551.

Annual or biennial. Strongly spiny, 15–60 cm high plant, covered with rather sparse, arachnoid, flexuous hairs and scattered spinules. Stem highly branched almost from base, erect. Basal leaves early-withering; 13 cauline leaves numerous, oblong-lanceolate to oblong-ovate, more or less pinnatifid or crenate-dentate, with lobes and teeth terminating in stiff spines, margin not or weakly thickened, base decurrent on stem in form of spiny wings, usually slightly narrowed below. Capitula usually rather numerous, in axils of middle and upper cauline leaves as well as terminal on branches, usually surrounded by three leaves (one sheathing and two lateral). Involucre 12–16 mm long; receptacular scales relatively thin and coriaceous. Flowers yellow. Achenes 2–4 mm long with short (0.3–0.7 mm long) crown and two long scabrous bristles at tip. July to October

Sands and gravel-beds at seacoast and in river valleys, often as a weed of the roadsides and inhabited places.—*European Part*: Lower Don (Taman Peninsula), Crimea (southern part); *Caucasus*: Eastern Transcaucasia (Muganskaya steppe). Western Transcaucasia (near seacoast). *General distribution*: Southern Europe (north to Hungary and Romania), northern Africa, West Asia, Canary Islands. Described from southern Europe (southern France, Italy). Type in London.

Section 2. *Scolymus*—*Scolymus* sect. *Euscolymus* DC. Prodr. VII (1838) 75.—Achenes with only crown at tip, without bristles; capitula predominantly terminal.

Type of section: type of genus.

2. ***S. maculatus*** L. Sp. pl. (1753) 813; DC. Prodr. VII, 75; Boiss. Fl. or. III, 713; Schmalh. Fl. II, 132; Stank. and Tal. Oprel. Vyssh. Rast. (1949) 681.—**IC.**: Rchb. Ic. Fl. Germ. XIX (1858) t. 1353.

Annual or biennial. Strongly spiny, 15–60 cm high plant, covered with very soft flexuous hairs (to almost glabrous) and rather numerous spinules. Stem branched almost from base, erect. Basal leaves early-withering; cauline leaves numerous, oblong-lanceolate to lanceolate-ovate, pinnatifid or pinnatipartite, with lobes terminating in very strong long spines, margin strongly thickened (in form of whitish ridge), base long decurrent on stem in form of spiny wings usually not narrowed below. Capitula usually rather numerous, terminal on stem and lateral branches, less often in axils of upper cauline leaves, usually enclosed by four to six spiny terminal leaves. Involucre 12–16 mm long; receptacular scales cartilaginous-coriaceous. Flowers yellow. Achenes 2.5–4 mm long, with very short (0.2–0.3 mm long) and narrow crown at tip, without bristles. Flowering July to October.

Only as an introduced weed of the roadsides and inhabited places.—

- European Part:* Crimea (reported by Schmalhausen on the basis of a single specimen from the herbarium of W.G. Besser without precise indication of locality). *General distribution:* southern Europe, northern Africa, Asia Minor, Canary Islands. Described from southern Europe (Italy and southern France). Type in London.

Subtribe 2. **CICHORIINAE** O. Hoffm. in Engl. and Prantl. Nat. Pflanzenfam. IV, 5 (1893) 353, p. min. p.; Stebbins in Madrono XII, 3 (1953) 70.—Trib. Lactuceae sect. 2. Crepideae Cass. in Dict. sc. nat. XXV (1822) 61, p. min. p. (solum gen. *Koelpinia*); sect. 3. Hieraciaceae Cass. op. cit. 63, p. min. p. (solum gen. *Arnoseris*); sect. 4. Scorzonereae Cass. op. cit. 64, p. min. p. (solum gen. *Cichorium*).—Trib. Lactucées, sect 2. Crépideées I. Lamspanées Cass. in Dict. sc. nat. XLVIII (1827) 422, p. min. p. (gen. *Koelpinia*); sect. 3. Hieraciées Cass. Ibid., p. min. p. (gen. *Arnoseris*); sect. 4. Scorzonérées IV. Catanancées Cass. op. cit.—Subtrib. Scorzonereae Dum. Fl. Belg. (1827) 63 p. min. p.—Trib. Cichoreae a) Cichoreae Dum. Analyse fam. pl. (1829) 30.—Trib. Cichoreae D. Don. in Edinb. New Philos. Journ. VI (1829) 307, p. p. (solum gen. *Cichorium*).—Trib. Catanancheae D. Don Ibid.—Subtrib. Lamspaneae Less. Synops. Compos. (1832) 126, p. min. p. (solum gen. *Koelpinia*); DC. Prodr. VII, 1 (1838) 76 (eodem ambitu).—Subtrib. Hyoserideae Less. op. cit. 127, p. min. p.; DC. Prodr. VII, 1 (1838) 78 (eodem ambitu); Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 219 p. min. p.—Subtrib. Rhagadioleae Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 220, p. min. p. (solum gen. *Koelpinia*).—Pappus of very short and broad scales or pappus coronate, short-toothed; sometimes totally absent. Pollen grains spiny-cristate (echinulate). Receptacle glabrous or with less numerous bristles or scales. Basic chromosome number in most genera: $x = 9$.

Type of subtribe: type of tribe.

GENUS 1632. *Cichorium* L.^{1, 2}

L. Sp. pl. (1753) 813.

Capitula usually rather numerous, less often (in very small specimens) solitary, in axils of middle and upper cauline leaves or terminal on stem and its lateral branches, homogamous, with rather many (8–20) bisexual ligulate florets. Involucre more or less cylindrical, 8–14 mm long and 4–7 mm wide; outer involucre bracts four to seven, irregularly arranged or almost in one row, ovate to broadly lanceolate, highly unequal in shape and size (and then shorter than inner bracts), or almost similar (and then almost as long as inner bracts), more or less pubescent of glabrous, more or less coriaceous in lower half, upper half
 15 herbaceous; inner bracts five to eight, in one row or almost so, lanceolate or linear-lanceolate, thin coriaceous or coriaceous-herbaceous, glabrous or more or less hairy. Receptacle almost flat, irregularly alveolate, covered with very short more or less toothed or fimbriate scales along margins—margins of alveoles. Flowers light blue, blue, bluish-pink or whitish (in albinos), usually longer than involucre; corolla 10–25 mm long, with (four) five (seven) rather long lanceolate teeth, more or less hairy (especially in upper part of tube). Anthers sagittate at base, with obtuse roundish, triangular appendage at apex. Style branches thin and rather long. Achenes 2–3.5 mm long, obovoid, or oblong, outer achenes distinctly flattened dorsally and adnate with inner involucre bracts, glabrous and smooth (less often with solitary spinules in upper part), with indistinct veins and three to five more or less prominent ribs, apex truncate, with narrow and shallow constriction below crown; pappus very short, 0.2–0.8 mm long, of numerous more or less scaly broad hairs in two or three irregular rows. Perennial, biennial, or annual herbs with more or less branched and relatively loosely leafy erect stems. Leaves runcinately pinnatifid to more or less toothed or undivided; basal leaves on short-winged petioles, usually in rosettes; cauline leaves sessile, amplexicaul.

Type of genus: *C. intybus* L.

About 10–12 species of the genus are mainly distributed in the region of the ancient Mediterranean from the Pyrenees and northern Africa to the western provinces of China; one species (*C. intybus* L.) is distributed almost throughout Europe and over a significant part of Asia;

¹Treatment by N.N. Tzvelev.

²Latin transcription of the Greek plant name—*kichorion*, which itself originates from the words *kio*—to move, and *chorion*—field (i.e., a plant often entering the borders of fields).

also found as an introduced plant in many temperate and subtropical countries of both hemispheres. Of these, four species are found in the USSR.

1. Whole plant, except involucre bracts, glabrous, less often nearly so (with isolated hairs in lower part of stem and along midrib of leaves), 30–120 cm high cultivated plant; involucre bracts more or less ciliate along margin, but without glands, outer bracts ovate-lanceolate to ovate, more or less distant, usually two-thirds as long as inner bracts, less often almost as long; pappus 0.4–0.8 mm long 4. **C. endivia** L.
- + Plants more or less pubescent or setose, at least in lower part of stem or leaves beneath 2.
2. Perennials (but usually short-lived); outer involucre bracts half to two-thirds as long as inner bracts, more or less squarrose, usually of unequal length and shape; corolla 15–25 mm long; pappus 0.2–0.3 mm long 1. **C. intybus** L.
- + Annuals or biennials; outer involucre bracts more or less as long as inner bracts and appressed to them, usually almost similar in length and shape; corolla 9–15 mm long; pappus 0.4–0.8 mm long 3.
3. Stem branches with divergent glandular hairs up to apex (bases of capitula); outer involucre bracts covered with numerous long glandular hairs in upper (foliaceous) half on both sides 2. **C. glandulosum** Boiss. and Huet
- + Stem branches glabrous or sparsely hairy with rather long, flexuous, eglandular hairs or bristles at apex; outer involucre bracts ciliate along margin in upper half, glabrous or with scattered simple hairs outside, usually glabrous within 3. **C. pumilum** Jacq.

Series 1. Intybus Tzvel.—Perennial plants with relatively thick, often many-headed cord-like root; outer involucre bracts half to two-thirds as long as inner bracts, more or less divergent; corolla 15–25 mm long; pappus 0.2–0.3 mm long.

1. **C. intybus** L. Sp. pl. (1753) 813; M.B. Fl. taur.-cauc. II, 262; DC. Prodr. VII, 84, excl. β ; Ldb. Fl. Ross. II, 774; Boiss. Fl. or. III, 715; Schmalh. Fl. II, 134; Grossh. Fl. Kavk. IV, 223 and Opred. Rast. Kavk. (1949) 502; Kryl. Fl. Zap. Sib. XI, 2966; Stank. and Tal. Opred. Vyssh. Rast. (1949) 682; Kuthath. in Fl. Gruzii VIII (1952) 596; Mikhailovsk. in Fl. Beloruss. V. (1959) 159; V. Nikit. in Fl. Turkm. VII (1960) 285; Karjag. in Fl. Azerb. VIII (1961) 482; Kovalevskaja in fl. Uzb. VI (1962) 417;—**Ic.**: Rchb. Ic. Fl. Germ. XIX (1858) t. 1357;

Syreistsch. Ill. Fl. Mosk. Gub. III (1910) 319; Fedtsch. and Fler. Fl. Evrop. Ross. (1910) 1035; Majevsk. Fl. (1918) 345; Hegi, Ill. Fl. VI, 2 (1929) t. 273, fig. 4; Jav. and Csap. Ic. Fl. Hung. (1933) 551; Stank. and Tal. op. cit. fig. 380; Zemlinskii, Lekarstv. Rast. SSSR (1951) 291; Majevsk.: Fl. Ed. 8 (1945) Fig. 233; Mikhailovsk. op. cit. Plate 52.—**Exs.:** Fl. exs. Reipubl. Bohem. Sloven. No. 972.

Perennials. Plants 20–150 cm high, green or glaucous-green; stem erect, usually more or less branched, branches often strongly divergent and slightly thickened toward apex, more or less setose or with crisped hairs, often glabrous or almost so. Leaves dorsally setose or crisped hairy, ventrally more or less crisped hairy; basal leaves usually persisting during flowering, runcinately pinnatipartite to undivided, but more or less toothed, gradually narrowed into winged petiole; cauline leaves (except lowermost; these similar to basal leaves) relatively less numerous and highly reduced, lanceolate-ovate to lanceolate, amplexicaul, with roundish or sagittate, often more or less toothed auricles. Capitula usually numerous, solitary or a few grouped together, terminal on stem and branches, and also in axils of middle and upper cauline leaves. Involucre 17 8–14 mm long; outer involucre bracts half to two-thirds as long as inner ones and usually more or less divergent, unequal in shape and length, relatively thin coriaceous in lower part, more or less ciliate along margin, more or less hairy on outer side, with simple or glandular hairs, often entirely glabrous; inner bracts usually more or less hairy or ciliate in upper part. Corolla 15–25 mm long, with varying shades of blue, sometimes whitish, rapidly discolored in water. Achenes 2–3 mm long, with 0.2–0.3 mm long pappus. Flowering July to October.

Meadows, forest glades, herb slopes, often as weed near roads, in fields, near inhabited places; in mountains up to middle belt.—*European Part:* all regions, but in north (Karelia-Lapland, Dvina-Pechora) only as a rare introduced plant; *Caucasus:* All regions; *Western Siberia:* Ob' (lower part), Upper Tobol, Irtysh (rarely); *Eastern Siberia:* Angara-Sayans and Dauria (only as rare introduced plant); *Soviet Central Asia:* All regions. *General distribution:* Almost all of Europe, northern Africa, West Asia, Iran, western provinces of China; as introduced plant in South Africa, North and South America, Australia and New Zealand. Described from Europe. Type in London.

Note. A more southern and xerophilous race predominates in Soviet Central Asia and southern and eastern Transcaucasia.—*C. intybus* subsp. *glaucum* (Hoffmagg. and Link) Tzvel. comb. nova [= *C. glaucum* Hoffmagg. and Link, Fl. Portug. II (1820) 178, t. 95], which is widely distributed almost throughout the Mediterranean Region. Specimens approaching it are also present on the southern coast of Crimea. This subspecies differs from typical *C. intybus* (subsp. *intybus*) by the glaucous-

green color of the entire plant, generally more divaricately branched stem, and entirely glabrous (without cilia and hairs) outer involucre bracts (inner bracts also eciliate, but pubescent at apex) and often was identified earlier as *C. divaricatum* [C.A.M. Verzeichn. Pfl. Cauc. (1831) 62] or as *C. intybus* var. *divaricatum* [Ldb. Fl. Ross. II, 774]. The range of both subspecies of *C. intybus* (subsp. *intybus* and subsp. *glaucum*) greatly overlap, and forms intermediate between them are found quite frequently. In my opinion, this overlapping of the range is to a great extent secondary and associated with the rapid spread of both subspecies (especially that of subsp. *intybus*) under human influence in recent times.

Economic Importance. The roots of the cultivated forms of this species (a whole series of varieties is known, for example, Borisovskii, Isopolinskii, and so on) are widely used for preparing a substitute for coffee ("chicory") and can be used for deriving sugar and alcohol. The leaves can be used as salad. The roots of the wild form are used in medicine for extracting a bitter substance that stimulates the activity of the digestive organs. A good honey-producing plant.

Series 2. Pumila Tzvel.—Annual or biennial plants with slender cord-like root; outer involucre bracts usually almost as long as inner
18 ones and appressed to them, less often (in *C. endivia*) shorter; corolla usually 9–15 mm long, less often (in *C. endivia*) up to 23 mm long; pappus 0.4–0.8 mm long.

2. *C. glandulosum* Boiss. and Heut in Boiss. Diagn. pl. or. ser. 2, III (1856) 87; Boiss. Fl. or. III, 716; Grossh. Fl. Kavk. IV (1934) 223 and Opred. Rast. Kavk. (1949) 502, p. p.

Annual or biennial. Plants 20–70 cm high, more or less glaucous-green. Stem erect, usually more or less branched, with branches rather strongly thickened toward apex, lower part glabrous or almost so, upper part densely covered with numerous, rather long, divergent, glandular hairs. Leaves usually more or less covered with curly and glandular hairs on both sides; basal and lower cauline leaves oblong, gradually narrowed into winged petiole, more or less toothed, often withering before flowering; cauline leaves relatively less numerous, sessile; middle leaves more or less narrowed and semiamplexicaul, upper leaves amplexicaul with roundish auricles, sharply toothed with teeth usually produced into long cusps. Capitula usually rather numerous, solitary, terminal on stem and branches. Involucre 8–12 mm long; outer involucre bracts almost as long as inner ones and appressed to them, coriaceous in lower half, herbaceous in upper half, covered with numerous rather long glandular hairs on both sides. Corolla 9–15 mm long, light blue, less often whitish. Achenes 2.5–3.5 mm long with 0.6–0.8 mm long pappus. Flowering June to September.

Gypsum-containing clayey slopes and screes.—*Caucasus*: Southern Transcaucasia (western parts: in the Araks River Basin). *General distribution*: Armenia and Kurdistan. Described from northeastern Turkey. Type in Geneva.

3. **C. pumilum** Jacq. Observ. bot. IV (1771) 3, t. 80.—*C. divaricatum* Schousb. Vextr. Marok. (1800) 197; Boiss. Fl. or. III, 716.—*C. intybus* β. *divaricatum* (Schousb.) DC. Prodr. VII, 84.—*C. endivia* β. *pumilum* (Jacq.) Vis. Fl. Dalm. II (1847) 97.—*C. endivia* subsp. *pumilum* (Jacq.) Hegi, Ill. Fl. VI, 2 (1929) 998.—*S. glandulosum* auct. non Boiss. and Huet: Grossh. Fl. Kavk. IV, 223 and Opred. Rast. Kavk. (1949) 502, p. p.; Karjag. in Fl. Azerb. VIII (1960) 483.— **Ic.**: Jacq. op. cit.; Rchb. Ic. Fl. Germ. XIX (1858) t. 1357.— **Exs.**: Fl. exs. austro-hung. No. 208.

Annual or biennial. Plants 15–50 cm high, green, often with glaucescent tinge. Stems erect, usually more or less branched, with divaricate branches strongly thickened toward apex, setose-hairy to completely glabrous below, glabrous or sparsely hairy (with rather long simple hairs or bristles) above. Leaves on both surfaces more or less covered with curly hairs and bristles; basal and lower cauline leaves on short-winged petioles, runcinately pinnatipartite to entire, more or less toothed; cauline leaves relatively few and strongly reduced, sessile, amplexicaul, often with more or less toothed auricles. Capitula usually rather numerous, solitary, terminal on main stem and branches, sometimes also in axils of upper cauline leaves. Involucre 8–12 mm long; outer involucre bracts almost as long as inner ones and appressed to them, coriaceous in lower half, herbaceous in upper half, long-ciliate along margin (but without glands), usually with a few-simple hairs on back, glabrous or almost so within. Corolla 9–15 mm long, light blue (?). Achenes 2.5–3 mm long, with 0.4–0.7 mm long pappus. Flowering July to October.

Clayey and stony slopes, also frequently a weed of the roadsides, inhabited places, and borders of fields; found up to lower mountain zone.—*Caucasus*: Southern and Eastern Transcaucasia, Talysh. *General distribution*: southern Europe, northern Africa, West Asia, Iran; introduced into northern Europe. Described from northern part of Balkan Peninsula. Type in Vienna.

4. **C. endivia** L. Sp. pl. (1950) 813; Schmalh. Fl. II, 134; Stank. and Tal. Opredel. Vyssh. Rast. (1949) 682.—*C. endivia* β. *sativa* DC. Prodr. VII (1838) 84.—*S. endivia* subsp. *endivia* Hegi, Ill. Fl. VI, 2 (1929) 998.— **Ic.**: Rchb. Ic. Fl. Germ. XIX (1858) t. 1358; Syreistsch. Ill. Fl. Mosk. Gub. III (1910) 319; Hegi, op. cit. fig. 687 and 688; Jav. and Csap. Ic. Fl. Hung. (1933) 551.

Annual or biennial. Plants glabrous, less often almost so, 30–120 cm high. Stem erect, usually divaricately branched, glabrous, less often with isolated bristles in lower part; branches usually distinctly thickened toward apex. Leaves glabrous, less often with isolated bristles or curly hairs along midrib, relatively thin and soft, green, less often slightly glaucescent; basal and lower cauline leaves on short-winged petioles, pinnatisect to undivided, more or less toothed, often crimped; middle and upper cauline leaves fewer, greatly reduced, oblong to broadly ovate, sessile, amplexicaul, with acute or more or less obtuse auricles. Capitula usually numerous, solitary or several grouped together at apices of main stem and branches, also in axils of middle and upper cauline leaves. Involucre 9–14 mm long; outer involucre bracts more or less ciliate along margin, usually two-thirds as long as inner bracts, less often almost as long, coriaceous in lower part; corolla 12–33 mm long, light blue, less often whitish, not decolorized in water. Achenes 2.5–3.5 mm long, with 0.4–0.8 mm long pappus. Flowering July to October.

Cultivated as salad plant in more southern areas of the USSR.—*General distribution*: Unknown in wild state: cultivated mostly in Mediterranean countries. Possibly described from southern Europe. Type in London.

Note. *C. pumilum* Jacq. is usually considered to be the ancestor of this species, although it is not found in the wild state. However, a whole series of characters is common to *C. endivia* L. and *C. intybus* L. (for example, a larger corolla than in *C. pumilum*, shorter outer involucre bracts, capitula not only terminal on branches but also in groups of a few in the axils of cauline leaves), which suggests, as a more probable origin, that *C. endivia* is the result of the hybridization of *C. intybus* × *C. pumilum* in the past.

Economic Importance. Cultivated widely in Mediterranean countries as a salad plant; known since ancient times. There are many varieties differing mainly in leaf shape and color.

GENUS 1633. *Arnoseris* Gaertn.^{1, 2}

De Fruct. et Semin. pl. II (1791) 355; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 360.

Capitula solitary or in groups of twos and threes on long peduncles, clavately thickened toward apex. Involucre two-rowed; inner involucre bracts enlarged and hardened on fruiting, enclosing peripheral achenes.

¹Treatment by I.T. Vassilchenko.

²From the Greek words *arnos*—lamb; and *series*—salad.

Receptacle glabrous. Corolla yellow. Achenes oblong-obovoid, pentaquetrous, and slightly compressed, small, without pappus and beak. Annual herbs with rosette of basal leaves and leafless flowering stems (scapes).

A monotypic genus.

1. **A. minima** (L.) Schweig. and Koerte, Fl. Erlang. II (1811) 72; Hegi, Ill. Fl. VI, 2, 1004; Klovov. in Vizn. Rosl. USSR, 584; Geideman, Opređ. Rast. Moldav. SSR (1954) 297.—*A. pusilla* Gaertn. De Fruct. et Sem. II (1791) 355; DC. Prodr. VII, 78; Ldb. Fl. Ross. II, 2, 773.—*A. clavata* Bub. Fl. Pyren. II (1900) 49.—*Hyoseris minima* L. Sp. pl. (1753) 809.—*Lampsana minima* Lam. Encycl. meth. III (1791–1792) 414.—**lc.**: Hegi, op. cit. fig. 693, 694; Rchb. Ic. Fl. Germ. XIX (1858) t. 1354.—**Exs.**: Fl. polon. exs. No. 361.

Annuals. Stems 5–30 cm high, simple or weakly branched, numerous, usually reddish, leafless, glabrous below, clavately thickened and hollow above (below capitula); leaves in basal rosette, oblong-obovate, more or less crenate-dentate, puberulent on lower side and along margin. Capitula solitary terminal on main stems and branches, 5–8(10) mm wide. Involucral bracts oblong-lanceolate (outer bracts small and narrow, linear-lanceolate), somewhat fluffy, finely ciliate along margin. Ligulate florets 22 pale to golden-yellow, one and one-half times as long as involucre. Achenes 1.5–2 mm long, obpyramidal, somewhat glossy, greenish-gray with five thick and lighter main ridges and five thinner longitudinal ribs in between, with barely raised, indistinctly toothed, membranous border at upper (broadened) end. Flowering April to September. (Plate I, Fig. 3.)

Sandy places and light (sandy loam) soils sometimes a weed in fields.—*European Part*: Baltic Region, Bessarabia, Upper Dniester, Upper Dnieper. *General distribution*: Central Europe, Atlantic Europe, Mediterranean Region; introduced into North America, Australia, and New Zealand. Described from western Europe. Type in London.

Note. Ledebour (l. c.) reported the presence of this plant near Penza and Moscow, which, however, has not been confirmed subsequently.

GENUS 1634. *Koelpinia* Pall.^{1, 2}

Pall. Reise III (1776) Anhang, 755.

Capitula small, 5–12-flowered. Receptacle glabrous or with less numerous bristles. Involucre one- or two-rowed; inner involucral bracts five to seven, much longer than outer (latter two); involucral bracts

¹Treatment by I.T. Vassilchenko.

²A.R. Koelpin, physician and naturalist, a contemporary of P.S. Pallas.



spreading at fruiting, vertical during flowering. Flowers yellow, becoming pale on drying, sometimes turning blue. Achenes free, stellately spreading, linear-cylindrical, often falcate, with hooked spines or tubercles on dorsal surface, and with tuft of divergent hooked bristles at apex. Annual herbs with linear, filiform or oblong leaves.

Types of genus: *K. linearis* Pall.

The genus includes four or five species, distributed in western and Soviet Central Asia, entering only a part of Europe (in the Precaspian semidesert).

1. Capitula large; flowers bright yellow, 15–20 mm long; receptacle with sparse hairs; achenes strongly curved (almost annular) 1. ***K. macrantha*** Winkl.
- + Capitula smaller; flowers pale yellow, 7–9 mm long, barely exceeding involucre; receptacle glabrous; achenes falcate to almost straight 2.
2. Achenes slightly falcate to straight, coarse (thickened), gradually but slightly narrowed toward apex, 15–25 mm long, dorsally with relatively sparse spinules-bristles, or with rows of short spines, or tubercles. Growing on sands and stony slopes 3. ***K. turanica*** Vass.
- 23 + Combination of characters otherwise 3.
3. Involucre (during flowering) 4–5 mm long; leaves linear, 1–2(5–7) mm wide; achenes dorsally more or less densely and uniformly spiny 2. ***K. linearis*** Pall.
- + Involucre 2–2.5 mm long during flowering; leaves piliform-filiform, 0.5–1.0 mm wide; achenes smooth or sparsely spinulose (or with tubercles on spine) 4. ***K. tenuissima*** Pavl. and Lipsch.

1. ***K. macrantha*** Winkl. in Tr. Peterb. Bot. Sada XI, 5 (1890) 285; Pavlov, Fl. Tsentr. Kazakhst. III, 312; M. Popov in Tr. Uzb. Gos. Univ. Ser. Biol. 14 (1941) 88; Kovalevskaja in Fl. Uzb. VI (1962) 421.—*K. linearis* Pall. var. *macrantha* (Winkl.) O. and B. Fedtsch. in Perech. Rast. Turk. 4 (1911) 306.—*K. maracandica* M. Pop. op. cit.

Annual. Stem branched, erect or ascending, glabrous or slightly pubescent, 10–35 cm high. Leaves narrowly linear, linear or broadly linear to oblong, 8–12(15) cm long, (0.6) 1–3 (4–7) mm wide, gradually narrowed into petiole, one- to three-veined. Capitula one or two, on long peduncles; receptacle with a few (mostly three to five) bristles. Inner involucral bracts 10–13 mm long, linear-lanceolate, ciliate along margin, arachnoid hairy (sometimes, besides white, black and shorter hairs also present); outer bracts less numerous, almost half as long as inner,

pubescent. Flowers about 15–20 mm long, (1)1.5–2.5(3) mm wide, much longer than involucre, yellow, turning slightly blue on drying. Achenes strongly curved (usually annular), cylindrical, with numerous short hooked spinules on outer side, in longitudinal rows, inner side without spines, grooved. Flowering March to May.

Stony, sandy and clayey slopes and plains in foothill deserts and in foothills, sometimes a weed in fields, orchards and on roadsides.—*Soviet Central Asia*: mountainous Turkmenia, Kara-Kum, Amu-Darya, Pamiro-Alai (southern). *General distribution*: Apparently found in adjacent regions of Iran and Afghanistan. Described from southern Tadzhikistan (Vakhsh-Kafirnigan). Type in Leningrad.

Note. The northern boundary of the distribution of this species passes along the Krasnovodsk-Chardzhou-Samarkand line. Popov (op. cit.) proposed recognition of a new species, *K. maracandica* M. Pop. Study of the material showed that both species are connected by a whole series of gradual transitions (with respect to length of ligules and width of leaves) and are also found in the same region. Therefore, there is insufficient reason to accept *K. maracandica* M. Pop. as a separate species. But within the limits of *K. macrantha*, there is considerable variation, apparently based on differences in the ecological conditions under which this species grows. On clayey compact soils, *K. macrantha* has narrow
 24 (almost filiform) leaves, and narrow ligules, not exceeding 15 mm in length. These plants, in particular, were included by Popov under the new species *K. maracandica*. However, plants of this type were described even earlier by Winkler as *K. macrantha*. Thus, *K. maracandica* M. Pop. should be referred to typical *K. macrantha*. On sands, the flowers of *K. macrantha* are larger and reach up to 15–20 mm with the ligule width of 2–3 mm, and the leaves also become wider (up to 2–5–7 mm wide); these plants can be referred to a separate variety (var. *arenaria* m.). Lastly, the flowers of *K. macrantha* on stony soils become similar to the flowers of the preceding variety, but the leaves are narrow: narrowly linear to filiform (var. *hyssarica* m.). All these varieties are not very sharply distinguishable from each other and are connected by transitional forms. Finally, mention must be made of the discovery by N.A. Androsov near Samarkand of the giant form of *K. macrantha* with wide oblong-obovate leaves, as well as the discovery by Radde in 1886 on sands near Imam-baba Station, of a pubescent form (*K. macrantha* var. *raddeana* Winkl. op. cit 148), 2.5–3 cm high with stiff leaves. In the latter case, a single specimen was collected which also apparently was damaged (eaten on by animals), making it impossible to determine the taxonomic position of this form, although Winkler made this very significant notation on the label attached to this plant: “An potius nova species?”

2. *K. linearis* Pall. Reise III (1776) Anhang, 755; DC. Prodr. VII, 78; Ldb. Fl. Ross. II, 2, 772; Jaub. and Spach. Ill. pl. or. III (1847–1850) 123; Boiss. Fl. or. III, 721; Winkl. in Tr. Peterb. Bot. Sada, XI, 2, 147; O. and B. Fedtschenko, Perech. Rast. Turk. 4, 306; Krasch. in Fl. Yugo-Vost. VI (1936) 437; Grossh. Fl. Kavk. IV (1934) 224; Pavlov, Fl. Tsentr. Kazakhst. III (1938) 332; M. Popov in Tr. Uzb. Gos. Univ. Ser. Biol. 14 (1941) 88; Kovalevskaja in Fl. Uzb. VI (1962) 420.—*K. latifolia* Winkl. in Tr. Peterb. Bot. Sada, XI, 5 (1890) 284.—*K. linearis* f. *latifolia* (Winkl.) O. Hoffm. in O. Paulsen, Pl. Coll. As. Med. (1903) 137.—*Rhagadiolus koelpinia* Willd. Sp. pl. III (1803) 1626.—**lc.**: Pall. op. cit. t. L, 1, fig. 2; Jaub. and Spach, op. cit., t. 286.—**Exs.**: GRF No. 1884.

Annual. Stems branched from base, glabrous or more or less pubescent, 5(10)–30(40) cm high. Leaves linear, oblong, up to 5–10(15) cm long and from 1–2 mm (with single longitudinal vein) to 5–7 mm wide (with three veins—var. *latifolia* (Winkl.) O. Hoffm.), more abundant in lower part of plant. Capitula one (or two) on slender axillary peduncles; one capitulum usually on peduncle originating from plant base (in middle of bush). Receptacle glabrous. Involucral bracts lanceolate-linear, more or less pubescent or almost glabrous; outer bracts two of three, short; inner bracts five to seven, longer (up to 5–8 mm). Flowers pale yellow, slightly longer than involucre. Achenes (8)12–15(16) mm long, light brown or light reddish-brown, usually six to eight, 25 stellately spreading, linear-cylindrical, and falcately incurved (sometimes almost annular); longitudinally grooved on inner side, with numerous hooked spinules on outer side, gradually narrowed above with apical crown of ovate, divergent, bent spinules. Achenes usually finely pubescent or glabrous. Flowering April to May.

Semideserts (plains and mountains), deserts (in mountains entering even middle zone), clayey, clayey-gravelly and stony soils; often a weed in irrigated fields (in oases) and unirrigated lands (in lower hills).—*European Part*: Lower Volga; *Caucasus*: Eastern and Southern Transcaucasia, Talysh; *Soviet Central Asia*: all regions. *General distribution*: West Asia (up to Himalayas), northern Africa. Described from Caspian plain (from Mt. Bogdo). Type in Leningrad.

Note. In spite of all the attempts to maintain the species *K. latifolia* Winkl., I must disagree with this, even though *K. latifolia* was recognized as a species by such authorities as M.G. Popov, N.V. Pavlov and others. The main character by which *K. linearis* is differentiated from *K. latifolia*—leaf width (leaves narrow, 1–2 mm wide, with a single vein in the former species and leaves wide, 5–7 mm wide, three-veined in the latter species)—is not constant, and all possible transitions are found; sometimes both wide and narrow leaves are found even on the same

plant. As regards the presence of gray tomentose pubescence on young stems and involucre of *K. latifolia* (to which M.G. Popov drew attention, op. cit.), it must be mentioned that even this character is extremely variable and inconsistent, and, incidentally, the young involucre and stems of the type specimen of *K. latifolia*, preserved in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, are only weakly hairy, nearly glabrous. If we also consider that *K. latifolia* does not have a separate range and is found scattered over the entire range of *K. linearis*, it becomes apparent that *K. latifolia* is nothing more than a variety of the latter species and the one associated with the better moisture conditions.

3. ***K. turanica*** Vass. in Flora Uzb. VI (1962) 479, 515.

Annual. stem rough, branched, ascending, up to 20–30 cm high, weakly hairy. Leaves linear (or narrowly linear), 1–1.5 to 2.5–3 mm wide, one-veined. Capitula on rather long (1 cm or longer) peduncles, axillary (one usually in middle) on short, lanate peduncle. Involucral bracts linear-lanceolate, more or less lanate, outer bracts one-third to half as long as inner ones, latter reaching length of 5–8(10) mm. Dry ligules light colored (whitish), only slightly longer than involucre. Achenes slightly curved to almost straight (or even straight), coarse (thickened), gradually but slightly narrowed toward apex, 15–25 mm long, grooved along length, puberulent or glabrous, with tuft of stellate, 26 divergent, hooked bristles at tip, and sparse bristles (uncate at apex) on outer side or with a row of short spinules or tubercles. Flowering March to April (May).

Sands, stony slopes.—*Soviet Central Asia*: Aralo-Caspian, Balkhash Region, Kara-Kum, Kyzyl-Kum, Syr-Darya, Amu-Darya. Endemic. Described from Repetek. Type in Leningrad.

4. ***K. tenuissima*** Pavl. and Lipsch. in Pavlov, Fl. Tsent. Kazakhst. III (1938) 332; Kovalevskaja in Fl. Uzb. VI (1962) 478.—*K. leiocarpa* M. Pop. in Tr. Uzb. Gos. Univ. Ser. Biol. 14 (1941) 88.

Annual. Stems slender, prostrate or ascending, glabrous or sparsely hairy, highly branched, 5–10(15) cm high. Leaves filiform, 0.5–1 mm wide. Capitula less numerous, axillary, 2–3 mm wide, on rather long slender peduncles. Inner involucral bracts linear-lanceolate, 2.5–4(5) mm long, more or less hairy; outer bracts half as long. Ligules barely exceeding involucre, pale (cream-colored) when dry. Achenes glabrous or with sparse scattered spinules along dorsal surface, weakly curved to almost straight, with apical tuft of hooked hairs, short (7–9–12 mm long) and slender, four of five, gradually broadened. Flowering April to May.

Saline, clayey and stony deserts, outcrops of gypsum-containing clay and red sandstone, often on takyr. — *Soviet Central Asia*: all regions. *General distribution*: Possibly found in Iran and Afghanistan. Described from the desert near Kzyl-Orda. Type in Moscow; isotype in Leningrad.

Note. Pavlov (op. cit.) noted that this plant is "found in highly saline, clayey and stony, desert steppes" in the region of Irgiz and Turgai. According to Pavlov, this species is distributed over the deserts of southern Kazakhstan and possibly into Iran and Afghanistan. "The plant is observed with difficulty," wrote Pavlov, "for it grows in extreme desert conditions and also has extremely fast and early vegetative growth."

- Subtribe 3. **SCORZONERINAE** Dum. Fl. Belg. (1827) 63 ("Scorzonereae") p. p.; Less. Synops. Composit. (1832) 131, p. p.; DC. Prodr. VII, 1 (1838) 99, p. p.; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 169, 222 p. p.; Stebbins in Madrono XII, 3 (1953) 75.—Trib. Lactuceae sect. 4. Scorzonereae Cass. in Dict. sc. nat. XXV (1822) 64, p. min. p.—Trib. Lactucées sect. 4. Scorzonérées II. Scorzonérées vraies Cass. in Dict. sc. nat. XLVIII (1827) 422, p.p.—Trib. Scorzonereae D. Don in Edinb. New Philos. Journ. VI (1829) 307.—Trib. Cichorieae b) Scorzonereae Dum. Analyse fam. pl. (1829) 30, p. p.—Sippe Tragopogoneae Sch. Bip.¹ in Flora XVII, 2 (1834) 476.—Leontodontinae O. Hoffm. in Engl. u. Prantl. Nat. Pflanzenfam. IV, 5 (1893) 361, p. min. p.—Pappus mostly of plumose hairs (bristles). Pollengrains spiny-cristate.
- 27 Receptacle glabrous, rarely more or less pubescent. Basic chromosome number $x = 6$ and 7. Principal veins usually arcuate-parallel. Plants glabrous or pubescent; pubescence of soft tomentose hairs or of different kind.

Type of subtribe: *Scorzonera* L.

GENUS 1635. *Scorzonera* L.^{1, 2}

L. Sp. pl. (1753) 790.

Capitula more or less large, cylindrical or obconical. Involucre oblong, almost cylindrical; involucre bracts many-rowed, imbricate, gradually increasing in size from outside inward, without (subgenus *Scorzonera*) or with corniculate projections at tip—caps [subgenus *Podospermum* (DC.) Lipsch.]. Receptacle pubescent (in some species of section *Tuberosae*) or mostly glabrous, alveolate; alveoles cartilaginous

¹I have deliberately omitted another publication of Bipontinus Schultz "Sceletum systematis articulati Cichoriacearum" (Sch. Bip. in Herb., and Winkl. *Jahrb. Pharm.* IV, 1841; vidi tantum seorsum impressum), where a detailed division of Cichoriae is given, but without any indication of the rank of the groups used.

along margins. Ligulate florets yellow, less often red and pink, truncate, five-toothed. Anthers sagittate at base, auricles acute or short-setose. Style branches slender. Achenes glabrous or pubescent, cylindrical, oblong, slightly (very rarely strongly) narrowed at apex; at base sometimes with hollow tubular appendage (stalk) (subgenera *Podospermum* (DC.) Lipsch. and *Pseudopodospermum* (Lipsch. and Krasch.) Lipsch.) or without it (subgenus *Scorzonera*), ribbed, smooth or scabrous along ribs; pappus hairs plumose or barbed, a few (5–10) longer, plumose in lower part, barbed above. Glabrous or pubescent perennials, less often semishrubs and biennials, with alternate, entire, pinnatifid, or pinnatisect leaves. Roots variable in shape, tuberous in many species.

Type of genus: *Scorzonera humilis* L.

The genus *Scorzonera* comprises nearly 170 species, distributed from central Europe and the Mediterranean Region to eastern Asia. Members of the genus are particularly abundant in Iran, Asia Minor, the Caucasus, and Soviet Central Asia, i.e., mostly in arid regions.

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1. Achenes with hollow swollen stalk at base 2.
- + Achenes at base without hollow swollen stalk. All leaves simple, entire, pinnatifid only in *S. bicolor*. Involucral bracts not corniculate at tip (subgenus *Scorzonera*) 14.
2. Leaves pinnatisect. Involucral bracts often corniculate (subgenus *Podospermum* (DC.) Lipsch.) 3.
- + Leaves simple, undivided. All involucral bracts without corniculate projections at tip (subgenus *Pseudopodospermum* (Lipsch. and Krasch.) Lipsch.) 55.
3. Biennials, with well-developed leafy stems 4.
- + Perennials usually with poorly developed stems 7.
4. Involucral bracts with white or yellowish tomentum on outer side at base 1. *S. lachnostegia* (Woron.) Lipsch.
- + Involucral bracts without tomentum on outer side at base 5.
5. Lateral segments of leaves elliptical-lanceolate or linear-lanceolate, terminal segment large and wide, oblong or ovate-lanceolate. Stems mostly ascending or prostrate 3. *S. calcitrapifolia* Vahl.
- + Lateral segments of leaves narrow and long, linear or linear-

¹Treatment by S.J. Lipschitz.

²From the Italian words *scorza*—root, and *nera*—black, because of the outer color of the root. Even more probable, from the Spanish name of this plant, originating from *escorzon*—a poisonous snake, as the root is used in Spain as a medicine against snake bite.

- lanceolate, terminal segment little different in shape from lateral segments. Stems mostly erect..... 6.
6. Achene stalk one-fourth or one-fifth as long as achene. Some leaves (particularly cauline ones) undivided; lateral segments few. Pappus readily detaching on touch 4. **S. songorica** (Kar. and Kir.) Lipsch. and Vass.
- + Achene stalk one-third or almost half as long as achene. All leaves pinnatisect. Pappus not readily detaching on touch..... 2. **S. laciniata** L.
7. Alpine plants. Stems scape-like. Almost all leaves crowded at stem base 8.
- + Plants of lower and middle zones. Stems leafy 10.
8. Plants glabrous. Leaves with large obovate, obtuse upper segment, and two or three pairs of short linear lateral segments (Khevsuretia) 12. **S. grigoraschvili** (Sosn.) Lipsch.
- + Plants more or less pubescent. Upper segment of leaves oblong, narrowed toward apex, often acute 9.
9. Plants green or grayish-green, weakly pubescent. Capitula large, 1.8–2(3) cm long in full bloom. 10. **S. meyeri** (C. Koch) Lipsch.
- + Plants gray from dense pubescence. Capitula smaller, up to 1.5 cm long in full bloom (Talysh). 11. **S. kirpicznikovii** Lipsch.
10. Achenes (11)12–15(16) mm long. Lateral lobes of leaves very narrow, about 1 mm wide (Talysh) 8. **S. grossheimii** Lipsch. and Vass.
- 29 + Achenes shorter 11.
11. Involucral bracts (outer) usually corniculate at apex. Achenes more or less sparsely hairy, less often glabrous. Peripheral achenes large, broad to winged, 2–3 mm wide. Lateral lobes of leaves rather wide, 2–3(5) mm wide 5. **S. armeniaca** (Boiss. and Huet) Boiss.
- + Combination of characters different..... 12.
12. Stems shorter, 10–25(30) cm high, usually whole plant white-tomentose. Achenes bottle-shaped, with ribs more or less undulately rugose. Achene stalk 3–4 mm long, with distinct ribs 9. **S. cana** (C.A.M.) O. Hoffm.
- + Stems taller, 20–30(40) cm high, weakly pubescent. Achenes not bottle-shaped, ribs not undulately rugose 13.
13. Rhizome thick, many-headed. Stems virgate, 15–25 cm high. Capitula many (10–20 on single plant), narrow-cylindrical, relatively small (10–15 mm long and 2–5 mm wide in bloom) 6. **S. schischkinii** Lipsch. and Vass.

- + Rhizome not so thick. Stems slender, branched, not virgate. Capitula fewer, obconical (6–8 mm wide in bloom) (Mashhadia) 7. **S. idae** (Sosn.) Lipsch.
- 14. Plants forming pad-like tussock with numerous stems. 15.
- + Plants not forming pad-like tussock with numerous stems 17.
- 15. Elastic rubber fibers visible to naked eye on breaking underground organs. Achenes pubescent. Capitula large, broadly cylindrical or obconical. 22. **S. tau-saghyz** Lipsch. and Bosse
- + Elastic rubber fibers not visible on breaking underground organs. Achenes glabrous. Capitula narrow-cylindrical 16.
- 16. Lateral branches usually numerous, flexuous, prickly, without capitula. upper leaves filiform. Stems 10–20 cm high 56. **S. acanthoclada** Franch.
- + Prickly lateral branches absent. All leaves linear and basal. Stems 20–30 cm high 57. **S. kuhistanica** M. Pop.
- 17. Basal and cauline leaves varying in degree of cutting of lamina, from almost entire or sharply toothed to pinnatifid. Florets yellow, corolla throat black-purple 19. **S. bicolor** Freyn and Sint.
- + All leaves always entire. Florets yellow, red, pink, single-colored 18.
- 30 18. Plants with large capitula (especially in fruiting specimens) reaching (3.5)5–8 cm long and 1.5–2(3) cm wide. Achenes (2)4–4.5 cm long, narrowed at apex into beak (section *Piptopogon* C.A. Mey. 19.
- + Plants with smaller capitula (on average, not more than 5 cm long in fruiting specimens). Achenes smaller, apex not narrowed into beak 25.
- 19. Plants small, stems 2–2.5 cm high. Many stems (up to 10) arising from root collar. Capitula at fruiting longer than stem 26. **S. albertoregelia** Winkl.
- + Plants much taller, with solitary (or less often two or three) stems. Capitula never longer than stem 20.
- 20. Capitula surrounded by more or less large adpressed bracts. Leaves broadly lanceolate or ovate-lanceolate, (2)2.5–4 cm wide, long-acuminate 21.
- + Capitula without large adpressed bracts. Leaves linear, herbaceous or broadly linear (up to 2 cm wide) 22.
- 21. Ligulate florets yellow. Bracts usually large, numerous (Tadzhikistan) 24. **S. bracteosa** Winkl.
- + Ligulate florets pink. Bracts smaller, fewer (Alai) 25. **S. alaica** Lipsch.
- 22. Florets yellow. Capitula more or less numerous, often in corymbose inflorescence (Far East) 23. **S. albicaulis** Bge.

- + Florets pink when dried (Soviet Central Asia) 23.
- 23. Capitula solitary, terminal on stem or lateral branches. Compound inflorescence not forming candelabrum-like corymb. Peduncles not always arcuately bent, sparsely leafy 24.
- + Capitula in more or less compressed candelabrum-like corymb. Peduncles arcuately bent, densely leafy 28. **S. petrovii** Lipsch.
- 24. Plants usually large, up to 30–35 cm high. Involucral bracts not black and without black spot. 27. **S. tragopogonoides** Rgl. and Schmalh.
- + Plants smaller, 7–15 cm high. Involucral bracts black or with distinct black spot 29. **S. baldshuanica** Lipsch.
- 25(18) Root collar fibrous from dead petioles and sheaths of basal leaves 26.
- + Root collar not fibrous and usually covered with more or less hardened undivided or partly cut up sheaths of basal leaves..... 34.
- 26. Florets purple or violet-pink. Stems usually densely leafy (section *Purpureae* Lipsch.) 27.
- + Florets yellow (section *Fibrillosae* Nakai) 28.
- 31 27. Leaves grooved. Stems solitary, with one or two to five capitula at apex. Achene ribs smooth. Plants with strong vanilla fragrance at time of flowering 20. **S. purpurea** L.
- + Leaves flat. Stems always with single capitulum. Achene ribs in upper part toothed-scabrous 20. **S. rosea** Waldst. and Kit.
- 28. Plants of alpine zone, almost leafless or with scape-like lower more or less pubescent stems. Capitula large (up to 5 cm long), broadly cylindrical. Involucral bracts more or less pubescent (Tien Shan) 30. **S. subacaulis** Lipsch.
- + Plants of steppe, forest-steppe and forest zone. Stems well developed (sometimes short), glabrous. Involucral bracts glabrous 29.
- 29. Plants small, usually 3–7(10) cm high, with filiform, spiral, narrow (1–1.5 mm wide) glaucous leaves, usually longer than stem (Trans-Baikal Region) 36. **S. curvata** (Popl.) Lipsch.
- + Plants medium-sized (usually more than 10 cm high), with wider leaves (more than 1–1.5 mm wide), not longer than stem.... 30.
- 30. Leaves ovate-lanceolate or broadly lanceolate, more or less distinctly undulate-crimped along margin. Stems mostly branched (Crimea and hilly Kazakhstan) 31 **S. crispa** MB.
- + Leaves linear, lanceolate-linear or broadly lanceolate, flat along margin 31.
- 31. Basal leaves with long petioles, broadly lanceolate, up to 4.5–5

- cm wide. Stems mostly tall, up to 35–40 cm high, thick, hollow, strongly sulcate, Capitula large, up to 4.5–5 cm long. Plants usually with rosettes of numerous basal leaves. 32.
- + Basal leaves with medium-sized petioles, linear-lanceolate, linear, or lanceolate, usually narrower than 4.5–5 cm. Stems shorter and less thick, indistinctly sulcate. Capitula smaller. Rosettes of basal leaves indistinct 33.
32. Plants green; stems tall, simple (north of the European part of the USSR, Urals, eastern Siberia) 32. **S. ruprechtiana** Lipsch. and Krasch.
- + Plants glaucous; stems usually branched (saline meadows and limans of southwestern European part of the USSR and Kazakhstan) 32. **S. pratorum** (Krasch.) Stáňkov
33. Capitula narrow-cylindrical. Stem branched, flowering branches slender, filiform (Arkadian Mountains in eastern Kazakhstan) 35. **S. dianthoides** (Lipsch. and Krasch.) Lipsch.
- + Capitula broadly cylindrical. Stems simple or branched, flowering branches thicker 34. **S. austriaca** Willd.
- 34(25) Involucral bracts with red spot at apex 35.
- + Involucral bracts without red spot at apex 36.
- 32 35. Basal leaves linear or linear-lanceolate, scarcely acuminate. Capitula (2.5)3–3.5(4) cm long (Siberia) 42. **S. radiata** Fisch.
- + Basal leaves ovate or oval, cuspidate. Capitula (3.5) 4–5 cm long (European part of the USSR) 43. **S. humilis** L.
36. Plants of saline habitats. Ligulate florets slightly exceeding involucre. Pappus snow-white 37.
- + Plants of other habitats 39.
37. Root thickened into ovoid-spherical tuber. Young leaves apically spirally twisted 59. **S. pusilla** Pall.
- + Root not thickened into tuber. Young leaves apically not twisted 38.
38. Plants glaucous. Leaves thicker and fleshy. Root collar thickened from more or less numerous remnants of hardened sheaths of basal leaves; inner surface of sheath lanate. Stems more or less numerous, branched. Capitula usually a few (four or five) (eastern Kazakhstan) 45. **S. mongolica** Maxim.
- + Plants green. Leaves less thick, somewhat fleshy. Root collar not thickened. Stems solitary, usually simple. Capitula solitary, or less often two 44. **S. parviflora** Jacq.
39. Achenes glabrous 40.
- + Achenes lanate or villous over entire surface 68.
40. Plants forming more or less dense tussock. Stems scape-like,

- almost leafless, slender, sometimes erect. Leaves narrowly linear or lanceolate, crowded at stem base [section *Pulvinares* (Boiss.) Lipsch.] 41.
- + Combination of characters different 44.
41. Stems distinctly leafy. Leaves lanceolate, 4–7 mm wide; basal leaves narrowed into grooved, tomentose petiole 41. ***S. koslovskyi*** Sosn.
- + Stems slightly leafy. Leaves linear, linear-filiform, usually much narrower (up to 4 mm wide), not narrowed into grooved petiole 42.
42. Plants usually (20)30–40 cm high. Stems mostly branched, numerous. Base of aerial part quite densely covered with hardened leaf sheaths (Caucasus) 40. ***S. rigida*** Auch. ex DC.
- + Plants shorter, (5)7–15 cm high. Stems simple, few. Base of aerial part not covered with hardened leaf sheaths (Caucasus) 43.
43. Whole plant, particularly leaves and involucre, covered with scattered long, flexuous, divergent hairs. Basal leaves linear, 1.5–2.5 mm wide 39. ***S. seidlitzi*** Boiss.
- 33 + Plants not covered with scattered long, flexuous and divergent hairs. Basal leaves filiform-linear, 0.5–1 mm wide 37 ***S. filifolia*** Boiss.
- 44(40) Leaves broadly oblong-ovate, ovate-elliptical, or broadly lanceolate, 2–4(8) cm wide, many-veined. Venation arcuate 45.
- + Leaves narrower; veins less prominent 46.
45. Whole plant very densely velutinous (shining), with snow-white hairs. Pappus reddish-brown (Akhalkalaki Plateau) 67. ***S. ketzkhoveli*** Sosn.
- + Whole plant weakly pubescent (not velutinous) or almost glabrous. Pappus dirty white (Karatau Range) 46. ***S. franchetii*** Lipsch.
46. Pappus hairs rigid, blackish-violet 47.
- + Pappus hairs not blackish-violet 48.
47. Basal leaves broadly lanceolate or ovate-lanceolate, petiolate (Pamiro-Alai) 65. ***S. hissarica*** Winkl.
- + Basal leaves herbaceous, linear, sessile (Turkmenia) 18. ***S. raddeana*** Winkl.
48. Root thickened into variously shaped tuber 49.
- + Root not thickened into tuber 59.
49. Achenes without basal stalk 50.
- + Achenes with basal stalk 55.
50. Capitula narrowly cylindrical, usually numerous (up to 20 and more on a plant). Young leaves narrowly linear, apically spirally

- twisted. Achenes smooth or somewhat scabrous 59. **S. pusilla** Pall.
- + Capitula broadly cylindrical, fewer. Basal leaves petiolate, ovate-orbicular, or oblong-lanceolate. Achenes strongly scabrous from numerous tubercles on ribs. Pappus of snow-white, densely plumose hairs 51.
51. Capitula 4–6 mm wide 52.
- + Capitula 7–15 mm wide 53.
52. Stems 20–30 cm high, with long internodes, leafy up to apex. Leaves flat along margin 60. **S. tadshikorum** Krasch. and Lipsch.
- + Stems 10–15 cm high, scape-like, branched from middle, flowering shoots more or less numerous; leaves crowded at base of branches; internodes short, leaves more or less undulate-crimped along margin 61. **S. ferganica** Krasch.
53. Flowers yellow (Soviet Central Asia) 54.
- 34 + Flower pink or violet (Caucasus) 64. **S. papposa** DC.
54. Leaves hard, cartilaginous, acuminate, along margin more or less undulate-crimped (Turkmenia) 62. **S. ovata** Trautv.
- + Leaves fleshy, obtuse, along margin flat 63. **S. crassifolia** Krasch. and Lipsch.
- 55(2) Stems more or less tall, sulcate, leafy up to apex. Mature achenes straw-yellow. Pappus white 13. **S. mollis** M.B.
- + Stems scape-like, usually short, leafy in lower part, less often with solitary leaves along whole stem. Pappus dirty gray 56.
56. Leaves bright green (if glabrous), broadly lanceolate, (4)6–12(16) mm wide. Tuber fusiform (Kuban) 16. **S. turkeviczii** Krasch. and Lipsch.
- + Leaves glaucous or grayish, narrower, 2–4(6) mm wide. Tubers nutty, spherical or ovoid 57.
57. Flowers red, violet when dry 15. **S. suberosa** C. Koch
- + Flowers yellow 58.
58. Tubers usually borne at soil surface, nutty. Leaves wider, 2–3 mm wide, often strongly undulate-crimped along margin 14. **S. leptophylla** (DC.) Krasch. and Lipsch.
- + Tubers borne at some depth from soil surface, ovoid, less often spherical. Leaves narrower, 1–2 mm wide, usually flat along margin 17. **S. turcomanica** Krasch. and Lipsch.
- 59(48) Semishrubs. Base of root collar covered with hardened, entire or slightly divided, sheaths of previous year's leaves. Stems numerous, virgate (Tien Shan) 58. **S. pseudodivaricata** Lipsch.
- + Perennials. Stems numerous, not virgate 60.

- 60. Flowers orange (mountains of Soviet Central Asia) 49. **S. transiliensia** M. Pop.
+ Flowers yellow or pink 61.
- 61. Leaves narrow, linear, 1–7(10) mm wide 62.
+ Leaves broadly lanceolate or ovate-lanceolate, wider, up to 2–2.5 cm wide 66.
- 62. Whole plant white tomentose. Ligulate florets pink (Shugnan). 50. **S. gracilis** Lipsch.
+ Plants grayish pubescent or glabrous. Ligulate florets yellow ... 63.
- 63. Achenes smooth along ribs. Capitula in racemes, usually few-flowered 64.
- 35 + Peripheral achenes with acute or obtuse tubercles along ribs in upper part. Capitula many-flowered. 65.
- 64. Capitula in long, sometimes interrupted racemes, often on short peduncles, sometimes almost sessile, narrowly cylindrical, bearing 6–8(12) flowers. Raceme more or less compact. Capitula before flowering ellipsoid or cylindrical. Involucral bracts 12–15 (Soviet Central Asia) 47. **S. turkestanica** Franch.
+ Capitula in indistinct corymbose raceme, usually on longer peduncles, broadly cylindrical. Raceme often lax. Capitula before flowering globose. Involucral bracts 20–32 (Soviet Central Asia) 48. **S. iliensis** Krasch.
- 65. Stems 20–50 cm high, solitary, straight, branched in upper half with projecting, erect, slender peduncles. Leaves flat along margins 51. **S. stricta** Hornem.
+ Stems shorter, 8–20 cm high, mostly two or three, usually branched from base, with bent (less often erect), thicker peduncles. Leaves somewhat hairy along margins 52. **S. pubescens** DC.
- 66. Plants taller, 25–75 cm high. Stems usually branched in upper part or less often from middle. Leaves mostly crowded in lower third of stem, mostly flat along margins. Capitula broadly cylindrical 53. **S. hispanica** L.
+ Plants shorter, (5)10–25(30) cm high. Stems usually branching from base. Leaves borne along entire stem, often undulate-crimped along margin. 67.
- 67. Leaves broadly lanceolate, strongly attenuate, acuminate. Achenes along ribs tuberculate-scabrous 54. **S. inconspicua** Lipsch. ex Pavl.
+ Leaves obovate-lanceolate, slightly acuminate. Achenes along surface squamose-prickly. 55. **S. chantavica** Pavl.
- 68(39) Roots cylindrical or fusiform, not thickened into ovoid-spherical tuber. Plants usually large 69.

- + Roots thickened into ovoid-spherical tuber. Usually small desert plants of spring (ephemerals). 76.
- 69. Plants snow-white from dense velutinous pubescence. Leaves elliptical or broadly lanceolate, with many pubescent veins (Akhalkalaki) 66. **S. sosnovskiy** Lipsch.
- + Nature of pubescence different 70.
- 70. Leaves wide, (1.5)2–5 cm wide, broadly lanceolate or lanceolate 71.
- + Leaves narrow, linear, 1–5 mm wide 72.
- 71. Gray. less often whitish plants with appressed hairs. Inflorescence panicate. Leaves along entire margin distinctly cartilaginous, scabrous 68. **S. latifolia** (Fisch. and Mey.) DC.
- + Whole plant densely tomentose (but not velutinous), Inflorescence almost corymbose (karabakh) 69. **S. pulchra** Lom.
- 72. Leaves with many veins, linear, 3–5(8) mm wide. 70. **S. safievii** Grossh.
- + Leaves with one to three veins 73.
- 73. Plants with scape-like solitary stems, (5)10–15 cm high. Leaves filiform, up to 1 mm wide. Achenes pubescent, but not lanate 38. **S. lipskyi** Lipsch.
- + Combination of characters different 74.
- 74. Stems virgate, upright, straight. Basal leaves soft, without distinct spiny cusp. Capitula few-flowered (with six or seven florets). Achenes 9–10 mm long (excluding pappus) 73. **S. ramosissima** DC.
- + Stems ascending or erect, not virgate. Leaves harder, mostly with prominent veins, long-attenuate into very thin, often bent tip. Capitula many-flowered (with more than 20 florets). Achenes 5–7 mm long (excluding pappus) 75.
- 75. Involucre puberulent or almost glabrous. Outer involucre bracts without subulate awn, less than half as long as inner bracts (Caucasus) 72. **S. biebersteinii** Lipsch.
- + Involucre densely lanate-villous. Outer involucre bracts at least half as long as inner ones (usually longer than half), with distinct subulate awn (south of the European part of the USSR, western Siberia, Soviet Central Asia) 71. **S. ensifolia** M.B.
- 76(68) Stems branched (Caspian deserts, Soviet Central Asia, western Siberia) (section *Tuberosae* Lipsch.) 77.
- + Stems simple (Caucasus) (subsection *Lanatae* Lipsch.) 83.
- 77. Capitula drooping after blooming. Leaves hard, almost coriaceous, with prominent veins 78.
- + Capitula somewhat drooping after flowering, leaves soft, not coriaceous. Veins less prominent 81.

78. Leaves broadly lanceolate, 0.8–3 cm wide, with many (5–11), mostly rather prominent veins 79.
 + Leaves narrowly lanceolate or linear, 0.3–0.5 cm wide, with three to five less prominent veins 80.
79. Leaf margins flat 79. *S. gageoides* Boiss.
 + Leaf margin somewhat strongly undulate-crimped (sometimes rolled); their tips often spirally twisted
 80. *S. circumflexa* Krasch. and Lipsch.
80. Involucre 8–10 mm long. Aerial part [of plant] 5–7 cm high. Capitula often solitary. Tuber very irregular, with large tubercles especially in lower part 82. *S. oxiana* M. Pop.
 + Involucre 10–15 mm long. Aerial part [of plant] 10–20(30) cm high. Capitula numerous. Branches more or less robust, ascending, often virgate after fruiting
 81. *S. litvinovii* Krasch. and Lipsch.
81. Leaves linear, 2–5 mm wide 82.
 + Leaves broadly lanceolate or oblong-lanceolate, 0.5–0.9(2.1) cm wide, covered with appressed tomentose hairs
 77. *S. sericeo-lanata* (Bge.) Krasch. and Lipsch.
82. Plants small, 4–8.5(11) cm high. Leaves canescent or almost glabrous 76. *S. tuberosa* Pall.
 + Plants taller, 8.5–20(40) cm high. Leaves and stems covered with more or less divergent silky hairs
 77. *S. sericeo-lanata* (Bge.) Krasch. and Lipsch.
- 83(76) Plants taller, (10)15–20(25) cm high with ascending stems, leafy; leaves usually much shorter than stems. Capitula large, up to 2–2.5 cm long. Florets one and one-half to two times as long as involucre, lemon-yellow
 74. *S. lanata* (L.) Hoffm.
 + Plants less tall, 3–7(10) cm high, with drooping (during fruiting) stems; leaves almost as long as stems. Capitula smaller, 0.8–1 cm long. Florets scarcely longer than involucre, orange-yellow
 75. *S. pseudolanata* Grossh.

Subgenus I. Podospermum (DC.) Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 7.—Gen. *Podospermum* DC. *Fl. Fr.* ed. 3, IV (1805) 61; Cass. in *Dict. sc. nat.* XLII (1826) 77; Less. *Synops. Compos.* (1832) 133 (sub nom. *Podosperma*, non Labill. excl. syn. Roth and Moench); DC. *Prodr.* VII (1838) 110; Endlicher, *Gen. pl.* (1838) 497.—Subgen. *Eupodospermum* Rouy, *Fl. Fr.* X (1908) 16; Ej. *Conspect. Fl. Fr.* (1927) 170.—Sect. *Podospermum* Benth. in Benth. and Hook. f. *Gen. pl.* II (1873) 532; Boiss. *Fl. or.* III, 757; O. Hoffm. in *Pflanzenfam.* IV, 5 (1893) 365.—Achenes at base with hollow swollen stalk. Leaves

pinnatisect. Involucral bracts often with corniculate projections (caps) at tip.

Type of subgenus: *S. laciniata* L.

Series 1. Laciniatae Lipsch. in Addenda XXVIII, 717.—Biennials with well-developed leafy stems. Achenes cylindrical, glabrous.

1. *S. lachnostegia* (Woron). Lipsch. Fragm. Monogr. Scorzonera II (1939) 11.—*Podospermum lachnostegium* Woron. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 1 (1933) 223; Grossh. Fl. Kavk. IV (1934) 234; Grossh. Opred. Rast. Kavk. 507.

Biennial? Stems up to 25 cm high, more or less pubescent, branched from base. Leaves sessile, pinnatisect; lateral leaf segments linear or linear-lanceolate, with elongate terminal segment. Lateral peduncles longer than leaves, leafless or with one or two linear, acuminate, small
38 leaves. Involucral bracts on outer side densely white lanate; inner bracts oblong-lanceolate, two times as long as outer bracts, almost glabrous; all bracts with distinct midrib. Achenes 9–10 mm long, cylindrical, glabrous; pappus snow-white, as long as achene, of plumose bristles. Flowering May.

Caucasus: Ciscaucasia. Endemic. Described from the vicinity of Zapadinsky farmstead. Type in Leningrad.

Note. It differs from all species of subgenus *Podospermum* by having floccose outer involucral bracts.

2. *S. laciniata* L. Sp. pl. (1753) 791; Willd. Sp. pl. III, 3 (1803) 1506; Boiss. Fl. or. III, 757 (excl. β . *calcitrapifolia*); Schmalh. Fl. II, 141, p.p.; Krasch. in Fl. Yugo-Vost. VI, 448; Askerova in fl. Azerb. VIII, 515 p. max. p.; Lipsch. in Fl. Turkm. VII, 302; Papava in Fl. Gruzii, VIII, 637.—*S. laciniata* var. *subintegrifolia* Lipsch. in Spisok Rast. Gerb. Fl. SSSR XIII (1955) 131.—*S. octangularis* Willd. op. cit. III, 3 (1803) 1506.—*Podospermum laciniatum* (L.) DC. Fl. Fr. IV (1805) 62; DC. Prodr. VII, 1, 111, (excl. var. *subulatum*); Ldb. Fl. Ross. II, 2, 782; Grossh. Fl. Kavk. IV (1934) 234; Grossh. Opred. Rast. Kavk. 507; Kryl. Fl. Zap. Sib. XI, 2979, p. min. p.—*P. muricatum* DC. Syn. pl. in Fl. Gall. (1806) 265.—**Exs.**: GRF No. 3997.

Biennial. Roots usually slender. Plant more or less arachnoid pubescent, especially in lower part, later often almost glabrescent. Stems erect or less often ascending, bent, (10)20–40(50) cm high, solitary or several, sulcate, simple or branched. Basal leaves long-petiolate, broader at base, pinnatisect, with narrowly linear or linear-lanceolate lateral segments; terminal segment longer than lateral ones; linear-lanceolate

or lanceolate; cauline leaves reduced, short-petiolate; number of lateral segments highly variable. Capitula cylindrical, 6–8 mm wide at flowering, 10–15(20) mm wide at fruiting. Involucre sparsely arachnoid pubescent, glabrescent; outer involucre bracts deltoid-lanceolate, sometimes corniculate at apex, with more or less distinct midrib; inner bracts oblong-lanceolate, two to three times as long as outer ones; all bracts narrow-scarious along margin. Florets pale yellow, longer than involucre. Achenes 10–12 mm long, cylindrical, light gray, glabrous, smooth, with obtuse longitudinal ribs, slightly bent in lower part (approximately one-third to half the length), swollen toward base, and light colored. Stalk straw-yellow, 4 mm long. Flowering April to May.

Plains and foothills on clayey and stony soils, sometimes as weed.—*European Part*: Crimea, Black Sea Region, Lower Don, Lower Volga; *Caucasus*: Ciscaucasia, Eastern and Southern Transcaucasia, Dagestan; *Soviet Central Asia*: mountainous Turkmenia. *General distribution*: central and southern Europe, Balkan-Asia Minor, Armenia and Kurdistan, Iran. Described from Germany and France. Type in London.

Note. A highly polymorphic species, which should undoubtedly be divided into several local races. Insufficient material, however, does not permit us to do this at present. Within the species, var. *elongata* Sch. 39 Bip. is distinguished by erect, tall (to 60 cm), thickened (to 7–8 mm), knotty, hollow, scabrous stem, usually with scattered fine papillae, very long (to 20–25 cm) leaves, and longer ray florets. Evidently, this variety is found under conditions of high humidity; in the USSR, such plants are known from Armenia (for example, the collection of J.N. Woronow from the vicinity of Takyaltu, in crop field, No. 12680). Probably, the name *S. octangularis* Willd. applies particularly to this variety.

3. *S. calcitrapifolia* Vahl, Symb. 2 (1791) 87; Willd. Sp. pl. III, 3 (1803) 1505; Guss. Pl. rar., 323.—*Podospermum calcitrapifolium* (Vahl) DC. Fl. Fr. vol. VI (1815) 455; C.A.M. Verzeichn. (1831) 62, p. p.; DC. Prodr. VII, 1, 110; Grossh. Fl. Kavk. IV (1934) 234; Papava in Fl. Gruzii, VIII, 638.—*P. intermedium* Guss. in DC. Prodr. VII, 1 (1838) 110, p. p.—*P. buxbaumii* C. Koch in Linnaea XVII (1843) 274.—*P. heterophyllum* C. Koch Ibid (1843) 275.—*S. laciniata* β. *calcitrapifolia* (Vahl) Bisch. ex Boiss. Fl. or. III (1875) 757.

Biennial. Plant glabrous or more or less arachnoid pubescent. Stems several or solitary, (15)20–30(45) cm high, branched above, usually ascending or prostrate below. Leaves pinnatisect or pinnatifid with linear-lanceolate, oblong-elliptical, or obovate-lateral segments and larger terminal segment; basal leaves long-petiolate, broader at base; cauline leaves reduced toward stem apex, short-petiolate or sessile; leaf incisions and shape of lateral segments variable. Capitula solitary, terminal on

stems and branches, cylindrical, 5–8 mm wide at flowering, 1–1.5(2) cm at fruiting. Involucre initially whitish pubescent, glabrescent; involucre bracts with narrow scarious margin and distinct midrib; outer bracts smaller, deltoid-lanceolate; inner ones oblong-lanceolate, two to three times as long as outer bracts; ligulate florets yellow, slightly longer than involucre. Achenes 10–12 mm long, grayish, glabrous, cylindrical, lower part twisted and broadened into stalk, with longitudinal light-colored ribs; ribs glabrous in stalk region, and indistinctly pubescent or (in immature achenes) glabrous above; stalk light colored, up to 4 mm long, one-third to half as long as achene; pappus as long as achene, white or reddish at base, pappus bristles plumose, longer hairs scabrous toward apex. Flowering April to May.

Plains and foothills, on clayey and stony soils, sometimes in crop fields as weed.—*Caucasus*: Ciscaucasia,? Dagestan, Eastern and Southern Transcaucasia. *General distribution*: Mediterranean Region, Iran. Described from Tunisia. Type in Copenhagen (?).

Note. Pending the collection of more complete and abundant material, it is not clear whether *Scorzonera calcitrapifolia* deserves to be recognized as a separate species. Possibly, it should be treated as a variety of *S. laciniata*; that is how this question was interpreted by Boissier (op. cit.). The only dependable distinction between the two species is the presence of a wider and larger terminal leaf segment in *S. calcitrapifolia*. However, this character is variable, and in several cases transitional forms are found that are difficult to include in either of the two species in question. The geographic distribution of *S. calcitrapifolia* also is not clear, as the study material of this species at my disposal was extremely limited. To judge from the analysis of type material of *Podospermum buxbaumii* C. Koch, which I found in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, the latter species is absolutely identical with *Scorzonera calcitrapifolia* Vahl, to the synonyms of which it has been relegated.

4. ***S. songorica*** (Kar. and Kir.) Lipsch. and Vass. in Spisok Rast. Gerb. Fl. SSSR, XIII (1955) 131; in Fl. Turkm. VII (1960) 302; Kovalevskaja in Fl. Uzb. VI, 436.—*Podospermum laciniatum* var. *songoricum* Kar. and Kir. in Bull. Soc. Nat. Mosc. XV, 2 (1842) 396.—*P. laciniatum* var. *integrifolium* Ldb. Fl. Ross, II, 2, (1845–1846) 782.—*P. laciniatum* auct. fl. Asiae Mediae, p. max. p.—*P. songoricum* (Kar. and Kir.) Lipsch. and Vass. in sched.—*S. praticola* Bornm. in sched. herb. “Bornmüller: Iter Persico-turcicum 1892–1893, No. 4109” nom. nud.

Biennial. Plant green; almost glabrous or weakly arachnoid-pubescent. Stems few, usually branched, less often simple, (10)15–40(50) cm high. Leaves pinnatisect, sometimes (especially often cauline)

undivided, oblong-linear or linear; lateral segments usually a few, linear, linear-lanceolate or oblong; terminal segment longer, oblong or oblong-linear, gradually narrowed below; basal leaves petiolate; cauline leaves sessile, narrowed toward base. Capitula numerous, 5–6 mm wide at flowering, up to 1 cm wide at fruiting. Involucre arachnoid-pubescent initially, almost glabrous at fruiting; outer involucral bracts oblong-ovate, sometimes corniculate at apex, one-third to half as long as oblong lanceolate inner bracts; ligulate florets yellow. Achenes narrowly cylindrical, almost straight, on lower side weakly thickened below, grayish, 10–12 mm long, with smooth longitudinal ribs; stalk light colored, 2–2.5(3) mm long, one-fifth to one-fourth as long as achene; pappus readily detaching, dirty white, as long as or slightly shorter than achene, bristles plumose. Flowering June to July (Plate II, Fig. 2.)

Montane steppes, steppe meadows in river valleys, as weed in irrigated and nonirrigated fields, sometimes on slightly saline habitats.—*Soviet Central Asia*: mountainous Turkmenia, Tien Shan, Pamiro-Alai, Dzhungaria-Tarbagatai, Balkhash Region, Aralo-Caspian. *General distribution*: Dzhungaria-Kashgaria (Kuldzha). Described from the Lepsa River. Type in Leningrad.

Series 2. Armeniacae Lipsch. in Addenda XXVIII, 717.—Perennials. Achenes often hairy, dimorphic: outer achenes broadened and winged, inner ones narrower and wingless.

- 41 5. *S. armeniaca* (Boiss. and Huet) Boiss. Fl. or. III (1875) 760.—*Podospermum armeniacum* Boiss. and Huet in Boiss. Diagn. pl. or. ser. II, No. 3 (1856) 92.—*P. isthmocarpum* Vass in Grossh. Opred. Rast. Kavk. (1949) 508.—*P. pallasianum* (Krasch. and Lipsch.) Grossh. Ibid (1949) 508.—*Scorzonera pallasiana* Krasch. and Lipsch. in Fl. Azerb. VIII (1961) 516 (descr. ross.).

Perennial. Plant greenish, pubescent, especially in lower part, glabrescent. Stems simple or branched, 15–30(40) cm high, usually two to two and one-half times as long as basal leaves. Leaves pinnatisect with linear or linear-lanceolate lateral segments, with undulate margin, and longer linear, linear-lanceolate or oblong terminal segment; basal and lower cauline leaves petiolate, petioles broadened toward base; upper cauline leaves reduced, often entire. Capitula solitary, terminal on stem and branches, large, 1–1.5(2) cm long and 6–8 mm wide. Involucre arachnoid-pubescent or almost glabrous; outer bracts usually corniculate at apex, oblong-ovate or lanceolate, much shorter than oblong-lanceolate inner bracts; margin, especially with fruits, scarious; ligulate florets yellow, bluish on outer side when dry. Achenes 7–10 mm long, with longitudinal ribs, more or less scattered pubescent above, usually dimorphic: outer achenes oblong, up to 3.5 mm wide, with more or less

broad-winged lateral ribs (other ribs less prominent), more or less scarious-rugose; inner achenes cylindrical, narrower, wingless; achene stalk 2–3 mm long; pappus slightly longer than achenes, white, pappus bristles plumose. Flowering April to June.

Dry montane, stony, and clayey slopes, sometimes as weed.—*Caucasus*: Eastern and Southern Transcaucasia, Talysh. *General distribution*: Iran.

S. armeniaca (Boiss. and Huet) Boiss. was described from eastern Anatolia. Type in Geneva.

Note. The type of *S. armeniaca* is not known to me. My description of the species is based on Caucasian specimens and differs slightly from that of Boissier. However, I have no doubt about the similarity of *S. armeniaca* with *S. pallasiana*. The characteristic feature of both taxa is the pubescent achene—a character very rarely found in the members of subgenus *Podospermum* (DC.) Lipsch. *S. pallasiana* Krasch. and Lipsch. was described in Russian from the Nakhichevan ASSR; the type is in Leningrad. *Podospermum isthmocarpum* Vass. (in diagnosis distinguished by “unique bottle-shaped achenes, swollen in the middle and with a constriction”), with its pubescent seeds, possibly belongs to *S. armeniaca* (Boiss. and Huet) Boiss. The bottle-shaped swelling of the achenes in this species is explained by the presence of a parasite in them, which became apparent from my sections.

Series 3. Schischkinianae Lipsch. in Addenda XXVIII, 717.—
42 Perennials. Root collars knotty. Stem well developed, leafy. Capitula small (up to 8 mm wide at flowering). Achenes glabrous, cylindrical. Growing in middle and lower mountain zones.

6. *S. schischkinii* Lipsch. and Vass. sp. nova in Addenda XXVIII, 717.—*Podospermum schischkinii* Vass. in Grossh. Opred. Rast. Kavk. (1949) 508 (descr. ross.).

Perennial. Rhizome thick, many-headed; whole plant almost glabrous or weakly arachnoid-pubescent, mainly in lower part. Stems (10)15–25 cm high, numerous, slender, virgate, branched, leafy. Leaves pinnatisect; basal and lower cauline leaves numerous, with petioles broadened into sheaths, remnants of which densely cover root collar; lateral segments of leaves few, usually long, narrow (1 mm wide); upper cauline leaves reduced, sessile, undivided, slightly broadened and semialexicaul at base. Capitula numerous, solitary, terminal on stem and branches, narrowly cylindrical, 10–15 mm long and 3–4 mm wide (at flowering). Involucre arachnoid-pubescent; outer involucral bracts oblong-ovate; inner ones oblong-lanceolate, two to two and one-half times as long as outer ones. Ligulate florets yellow, slightly longer than involucre, ligules fimbriate at apex (over 0.5–0.7 mm length). Achenes 9–10 mm long,



glabrous, narrowly cylindrical, with longitudinal ribs, base clavately thickened and slightly curved, stalks 1.5–1.75 mm long; pappus dirty-white, as long as achene, pappus bristles plumose. Flowering June to July.

Stony slopes near seacoast.—*Caucasus*: Western Transcaucasia (Anapa). Endemic. Described from Anapa. Type in Leningrad.

7. *S. idae* (Sosn.) Lipsch. comb. nova.—*Podospermum idae* Sosn. in Dokl. Akad. Nauk Azerb. SSR, IV, 5 (1948) 211; Grossh. Opred. Rast. Kavk. 508; Papava in Fl. Gruzii VIII, 641.—*Ic.*: Fl. Gruzii VIII, Plate 433.

Perennial. Plant glaucescent. Stem up to 25 cm high, simple or mostly branched almost from base with apically adpressed branches, leafy, weakly pubescent. Leaves pinnatisect; basal leaves up to 15 cm long, simple, narrowly linear, sometimes with a few short linear segments in upper part; lower and upper cauline leaves similar to basal leaves, narrow-linear, reduced. Capitula obconical, small, 8 mm wide at flowering, about 15 mm long and 10 mm wide at fruiting. Involucre weakly pubescent; outer bracts short, middle bracts lanceolate, inner ones oblong-lanceolate; all bracts slightly scarious along margin. Ligulate florets yellow, one and one-half times as long as involucre. Achenes 8 mm long, glabrous, outer achenes appressed, slightly broadened, angular-ribbed; stalk white, 2 mm long; pappus white, almost as long as achene or slightly longer, bristles soft. Flowering July.

Dry slopes in middle mountain zone.—*Caucasus*: Eastern Transcaucasia (Mashhadia). Endemic. Described from Mashhadia. Type in Tbilisi.

Series 4. Grossheimianae Lipsch. in Addenda XXVIII, 718.—Perennials with well-developed stems. Leaf sheaths covering root collar. Achenes slender, terete, long (up to 16 mm). Growing in middle mountain zone.

8. *S. grossheimii* Lipsch. and Vass. sp. nova in Addenda XXVIII, 718.—*Podospermum grossheimii* Vass. in Grossh. Opred. Rast. Kavk. (1949) 509 (descr. ross.).—*Scorzonera grossheimii* (Vass.) Lipsch. ex Isaev in Fl. Azerb. VIII (1961) 519 (descr. ross.).

Perennial. Plant weakly arachnoid-pubescent, glabrescent, with knotty root. Stems numerous, erect or ascending, slender, branched in lower part, (15)20–25 cm high. Leaves pinnatisect, predominantly basal or crowded in lower part of stem; lateral segments of leaves narrowly linear or linear-lanceolate, about 1 mm wide, remote; terminal segment oblong; basal and lower cauline leaves with long petioles broadened at base into straw-yellow to brown sheath, covering root collar; cauline leaves reduced, solitary, undivided, narrowly linear, sessile. Capitula narrowly

cylindrical, solitary, terminal on stem and branches, 4–5 mm wide at flowering, up to 1 cm wide at fruiting. Involucre arachnoid-pubescent, glabrescent at fruiting; involucre bracts oblong-lanceolate or lanceolate; outer bracts often corniculate at apex; inner bracts two to three times as long as outer ones. Ligulate florets yellow. Achenes (11)12–15(16) mm long, glabrous, smooth, slender, cylindrical, grayish-reddish-brown, with longitudinal ribs; stalks light colored, one-fourth as long as achene; pappus dirty white, its bristles plumose, longer ones barbed-scabrous above. Flowering June to July.

Dry rubble slopes.—*Caucasus*: Talysh. Endemic. Described from Talysh. Type in Leningrad.

Series 5. Canae Lipsch. in Addenda XXVIII, 718.—Perennials. Achenes in lower part truncate and broadened, “bottle-shaped”; outer achenes wider; inner ones narrow, terete. Growing in foothills and foothill plains.

9. *S. cana* (C.A.M.) O. Hoffm. in Pflanzenfam. IV, 5 (1893) 365; Askerova in Fl. Azerb. VIII, 516.—*S. cana* (C.A.M.) Grossh. in Beih. Bot. Centralbl. XLIV, 2 (1928) 247.—*Podospermum canum* C.A.M. Verzeichn. (1831) 62, p. p. quoad plant. becuens; DC. Prodr. VII, 1, 110–111, excl. var. *glabratum*; Ldb. Fl. Ross. II, 2, 781, excl. var. *glabratum*; Grossh. Fl. Kavk. IV (1934) 234, p. p.; Papava in Fl. Gruzii 45 VIII, 641, p. p.—*S. laciniata* auct. non L.: M.B. fl. taur-cauc. II (1808) 237 excl. syn. Jacq.; III (1819) 524, p. p.—*Scorzonera runcinata* Pall. Reise in die südl. Statth. Russ. Reichs. I (1779) 221, nomen; Krasch. in Fl. Yugo-Vost. VI (1936) 448 (descr. ross.).—*Arachnospermum canum* (C.A.M.) Domin in Ber. Deutsch. Bot. Gesellsch. LVIIIa (1940) 263.—*Ic.*: Fl. Azerb. VIII, Plate LIII, 1.

Perennial. Plant grayish from arachnoid-pubescent, glabrescent. Stems ascending, weak, usually few, (7)8–12(20) cm long, simple or branched. Leaves mostly in lower part, pinnatisect with narrowly linear or lanceolate (and oblong)-linear segments; these also broadly lanceolate or oblanceolate; terminal segment oblong; basal leaves long-petiolate, petiole broadened at base into light colored glossy sheath, covering root collar; cauline leaves reduced, sessile, sometimes undivided. Capitula (1)1.2–1.5(2) cm long, 5–10 mm wide (at flowering), solitary, terminal on stems and branches. Involucre arachnoid-pubescent, glabrescent; outer involucre bracts lanceolate, often corniculate at apex; inner bracts oblong-lanceolate, two to two and one-half times as long as outer ones, margin more or less scarious. Ligulate florets yellow, sometimes turning pink on drying, longer than involucre. Achenes (7)9–10 mm long, longitudinally ribbed, in lower part truncate, and broadened, with prominent ribs; outer achenes broader, inner ones narrower, slender,

cylindrical; stalk almost one-third to half as long as achene; pappus dirty white, as long as achene, pappus bristles sparse and long plumose, brownish in lower part. Flowering April to June.

Dry rubbly-stony slopes, foothills and plains.—*European Part*: Crimea, Lower Don, Lower Volga; *Western Siberia*: ?southern part of Upper Tobol; *Caucasus*: Ciscaucasia, Eastern Transcaucasia, Dagestan. *General distribution*: Iran (northern). Described from the Caucasus (vicinity of Baku). Type in Leningrad.

Note. *S. cana* is a polymorphic species and, after collection of additional new material, probably will be divided into several local races. Meyer, under the name used by him, *Podospermum canum*, mixed up the plain and mountain forms. I designate as the type of this species the less pubescent specimens collected by Meyer "In collibus pr. Baku 12. IV.1830." The specimens from Talysh, also determined by Meyer as *Podospermum canum*, are strongly canescent, belonging to the high-mountain members of subgenus *Podospermum*, representing a unique, Talysh race, which I am separating under the name *S. kirpicznikovii* m. among the study material of *S. cana* is a sharply differentiated variety with short, 6–7(8) mm, wider bottle-shaped achenes, the achene stalk being brown with prominent white ribs, the ribs in the upper part of the fruit hairy-rugose—var. *verucoso-costata* Lipsch.—Specimens from northern Kazakhstan (vicinity of Petropavlovsk, 6, VI, 1844, K. Meinsgauzen) are distinguished by greater height (25–30 cm), erect stems, almost entire, linear, basal leaves, some of them pinnatisect, and the root collar more densely covered with leaf sheaths. The achenes are unknown. It evidently is a separate race requiring further study in nature.

Series 6. Alpigenae Lipsch. in Addenda XXVIII, 719.—Ser. *Alpigenae* Grossh. generis *Podospermi* DC. in Zam. po Sist. i Geogr. Rast. Tbil. 13 (1947) 66.—Forming tussock. Stem scape-like with a few reduced leaves. Leaves predominantly basal. Capitula large, 1.5–2.5 cm long (at flowering). Outer involucre bracts usually corniculate. Achenes slender, cylindrical, glabrous. Growing in Caucasian high mountains.

10. *S. meyeri* (C. Koch) Lipsch. in Fl. Azerb. VIII (1961) 518.—*Podospermum meyeri* C. Koch in Linnaea XXIII (1850) 659; Grossh. in Zam. po Sist. i Geogr. Rast. Tbil. 13 (1947) 66; Grossh. Opred. Rast. Kavk. 508; Dmitrieva, Opred. Rast. Adzharii, 287; Papava in Fl. Gruzii VII, 638.—*P. canum* β. *glabratum* DC. Prodr. VII, 1 (1838) 111; Ldb. Fl. Ross. II, 2, 763.—*P. ponticum* Stev. in Bull. Soc. Nat. Mosc. XXIX, 4 (1856) 404 in textu.—*P. canum* var. *integrifolia* Trautv. in Tr. Peterb. Bot. Sada II (1873) 558.—*Scorzonera jacquiniana* (C. Koch) Boiss. p. p. and β. *alpina* Boiss. p. p. in Fl. or. III (1875) 757.—*Podospermum alpigenum* auct.: Grossh. Fl. Kavk. IV (1934) 234; Grossh. op. cit. (1947)

67; Grossh. Opred. Rast. Kavk. 508; Dmitrieva, op. cit. 287; Papava, op. cit. 641.—*P. tenuisectum* Grossh. and Sosn. in Grossh. op. cit. (1947) 67, excl. plant. talyshens.—? *P. alpigenum* C. Koch in Linnaea XXIII (1850) 658.—? *Scorzonera alpigena* (C. Koch) Grossh. in Beih. Bot. Centralbl. XLIV, 2 (1928) 247.

Perennial. Plant green or greenish-gray, more or less pubescent or often glabrous plants with thick root; root collar branched, covered with brown sheaths of slightly divided basal leaves; stems scape-like, (3)5–15(20) cm high, few, less often solitary. Leaves mostly basal, half as long to as long as stem, pinnatisect or entire (var. *integrifolia* Trautv.), narrowed into petiole basally broadened into sheath; lateral segments of leaves remote, usually less numerous, linear, acuminate; terminal segment oblong, linear; cauline leaves reduced, few, two or three (five), linear, often undivided. Capitula solitary at apices of stem and less often of branches, large, (1.5)1.8–2(2.5) cm long and 1–1.2 cm wide (at flowering). Involucre pubescent, later glabrescent. Involucral bracts often dark colored, especially at apex; outer bracts lanceolate, often corniculate at apex, one-third to half as long as oblong-lanceolate inner bracts. Ligulate florets yellow (in dry condition light lilac), distinctly (one and one-half to two times) longer than involucre. Achenes slender, terete, 9–10 mm long, with longitudinal thin ribs, at base with light colored, slightly bent, 1(2) mm long stalk; pappus slightly shorter than achene or as long, rusty or dirty white, pappus bristles sparsely plumose, finely barbed above. Flowering June to August. (Plate II, Fig. 1).

In alpine zone on meadows, grass plots, screes, moraines, at 2,400–2,900 m.—*Caucasus*: Ciscaucasia (eastern), Dagestan, Eastern and Southern Transcaucasia. *General distribution*: Balkans-Asia Minor, Armenia and Kurdistan, Iran. Described from Elbrus. Type in Leningrad.

Note. Under the name *S. meyeri* (C. Koch) Lipsch. I am uniting three “species” of Caucasian alpine “*Podospermum*,” which were separated by Grossheim: *Podospermum meyeri*, *P. tenuisectum*, and *P. alpigenum*. Specimens of Gurjel (in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR), identified as *Podospermum canum* C.A.M. var. *glabratum* DC., and cited by DeCandolle (cp. Prodr. VII, 1 (1838) 111), correspond to the interpretation of C. Koch [cp. Linnaea, XXIII (1850) 659] of his species *Podospermum meyeri*. As regards the species *Podospermum alpigenum* C. Koch, *S. alpigena* (C. Koch) Grossh. (cp. Beih. Bot. Centralbl. XLIV, 2 (1928) 247, where for the first time this combination was made) is described from the Pontic Range (Turkey). I have not seen the type of Koch and, therefore, refrain from accepting this name. Boissier united several species (for example, *Scorzonera alpigena* (C. Koch) Grossh., *S. pulvinata* Lipsch., *S. subintegra* (Boiss.) Thiébaud, etc.) under the name *S. jacquiniana* (C.

Koch) Boiss., with varieties *alpina* Boiss. and *subintegra* Boiss. (Fl. orient. III (1875) 757). As a result, *S. jacquiniana* sensu Boiss. is an aggregate unit.—The prostrate dwarf form of *S. meyeri* (C. Koch) Lipsch. is 1–3 cm high—f. *nana* (Grossh.). Askerova (Fl. Azerb. VIII (1961) 519) described var. *kubensis* Asker. This variety, described from Tiflis (the Kuba Mountains of the Greater Caucasus), is characterized by the author as “forming a perennial plant with a many-headed root, (stem—S. L.) up to 5 cm high. Leaves pinnatisect, with short oblong-lanceolate segments, having dense, and short pubescent. Involucral bracts appressed gray-tomentose.” I did not see specimens of this variety; therefore, this taxon remains unknown to me.

11. ***S. kirpicznikovii*** Lipsch. sp. nova in Addenda XXVIII, 719.—Isaev in Fl. Azerb. VIII (1961) 520 (descr. ross.).—*Podospermum canum* C.A.M. Verzeichn. (1831) 62, p. p. quoad plant. talyschens.; DC. Prodr. VII, 1, 110, p. p. (excl. var. β . *glabratum* and plant. talyschens.).—*P. tenuisectum* Grossh. and Sosn. in Zam. po Sist. i Geogr. Rast. Tbil. 13 (1947) 67, quoad pl. talyschens.

Perennial. Plant whitish-gray; root collar covered with remnants of sheaths of basal leaves; sheaths hard, shining, often incised. Stem scape-like, 6–12(15) cm high, simple, less often branched above and then with two capitula, pubescent, leafless or with isolated leaves, two times or one-third as long as basal leaves. Leaves predominantly basal,
 48 numerous, grayish-pubescent, up to 8 cm long, all leaves pinnatisect with large number of lateral linear narrow (1–1.5 mm wide) segments, terminal segment oblong, narrowly linear; cauline leaves reduced, two or three, or absent. Capitula up to 1.5 cm long at flowering (including ligulate flowers), 1.8–2 cm long at fruiting. Involucre more or less pubescent, pubescence sometimes rubbed off; outer bracts smaller, triangular or triangular-lanceolate, often with cornicles at apex; inner bracts oblong-lanceolate, two to two and one-half times as long as outer ones. Ligulate florets grayish-yellow, pink on drying. Achenes slender, terete, 7–8(10) mm long, glabrous, smooth, with more or less distinct longitudinal ribs; stalk short; pappus dirty white, its bristles up to two-thirds plumose, scabrous above.

Subalpine meadows.—*Caucasus*: Talysh. Endemic. Described from Talysh. Type in Leningrad.

Note. The Talysh specimens of Meyer, treated by him as *Podospermum canum*, are sharply distinct from the Baku specimens, designated by me as the type of *S. cana*, by the structure of the achenes; they belong to the montane members of the subgenus *Podospermum*.

12. ***S. grigorashvili*** (Sosn.) Lipsch. comb. nova.—*Podospermum grigorashvili* Sosn. in Dokl. Akad. Azerb. SSR, IV, 5 (1948) 212;

Grossh. Opred. Rast. Kavk. 508; Papava in Fl. Gruzii VIII, 638.—**lc.**: Fl. Gruzii VIII, Plate 433.

Perennial. Plant completely glabrous, forming tussocks; root vertical, thick, many-headed, producing sterile rosette and flowering shoots. Stems ribbed-sulcate, short, 4–12 cm (at fruiting up to 25 cm) high. Leaves crowded at stem base; basal leaves up to 9 cm long, outer [lower] undivided, oblong-spatulate, narrowed or slightly broadened at apex, at base with two teeth; upper leaves oblong, pinnatipartite, terminal segments much larger than lateral ones, oblong-lanceolate or oblong-spatulate, obtuse; lateral segments short, linear; all [basal] leaves with petioles broadened at base, covering root collar; cauline leaves few (one to three), linear-spatulate, obtuse. Capitula at fruiting obconical, 1–1.5 cm wide. Involucre somewhat pubescent; bracts blackish, oblong-lanceolate, obtuse; inner bracts sometimes carinate. Achenes 0.8–1 cm long, olive-green slightly curved, with longitudinal ribs, glabrous; stalk indistinct; pappus white, almost two times as long as achene, pappus bristles fragile, up to two-thirds plumose, barbed above. Flowering August to September.

Alpine areas in meadows.—*Caucasus*: Eastern Transcaucasia (Khevsuretia). Endemic. Described from Khevsuretia. Type in Tbilisi.

Subgenus II. Pseudopodospermum (Lipsch. and Krasch.) Lipsch. comb. n.—Sect. *Pseudopodospermum* Lipsch. and Krasch. in Lipsch. Fragm. Monogr. Scorzonera, I (1935) 70.—Species mostly with
49 underground tubers. Ligulate florets yellow or red. Achenes stalked, more or less with tubercles or spinules along ribs. Leaves simple, linear or lanceolate. Involucral bracts not corniculate. By the nature of the achenes (presence of stalks), it approaches the species separated as members of the genus *Podospermum* DC. (i.e., subgenus *Podospermum* (DC.) Lipsch.), from which it differs in having simple, nonpinnate leaves and in most cases underground tubers. It differs from the members of subgenus *Scorzonera* by the presence of stalked achenes.

Type of subgenus: *S. mollis* M.B.

Series 7. Molles Lipsch. in Addenda XXVIII, 719.—Root tuberous, near soil surface or deeper. Stems more or less tall, sulcate, leafy to apex. Ligulate florets yellow.

13. **S. mollis** M.B. Fl. taur-cauc. III (1819) 522; DC. Prodr. VII, 1, 122 (excl. var. *leptophylla* DC.) Stev. in Bull. Soc. Nat. Mosc. XXIX, 4, 405; Boiss. Fl. or. III, 761 (quoad pl. tauric.); Grossh. Fl. Kavk. IV (1934) 239; Lipsch. Fragm. Monogr. Scorzonera I (1935) 74; Krasch. in Fl. Yugo-Vost. VI, 447; Grossh. Opred. Rast. Kavk. 510.—*S. tomentosa* auct. non L.: Pall. Reise III (1776) 513, 537, 654, 682, secund. Ldb.—*Podospermum villosum* auct. non M.B.: Stev. in DC. Prodr. VII, 1 (1838)

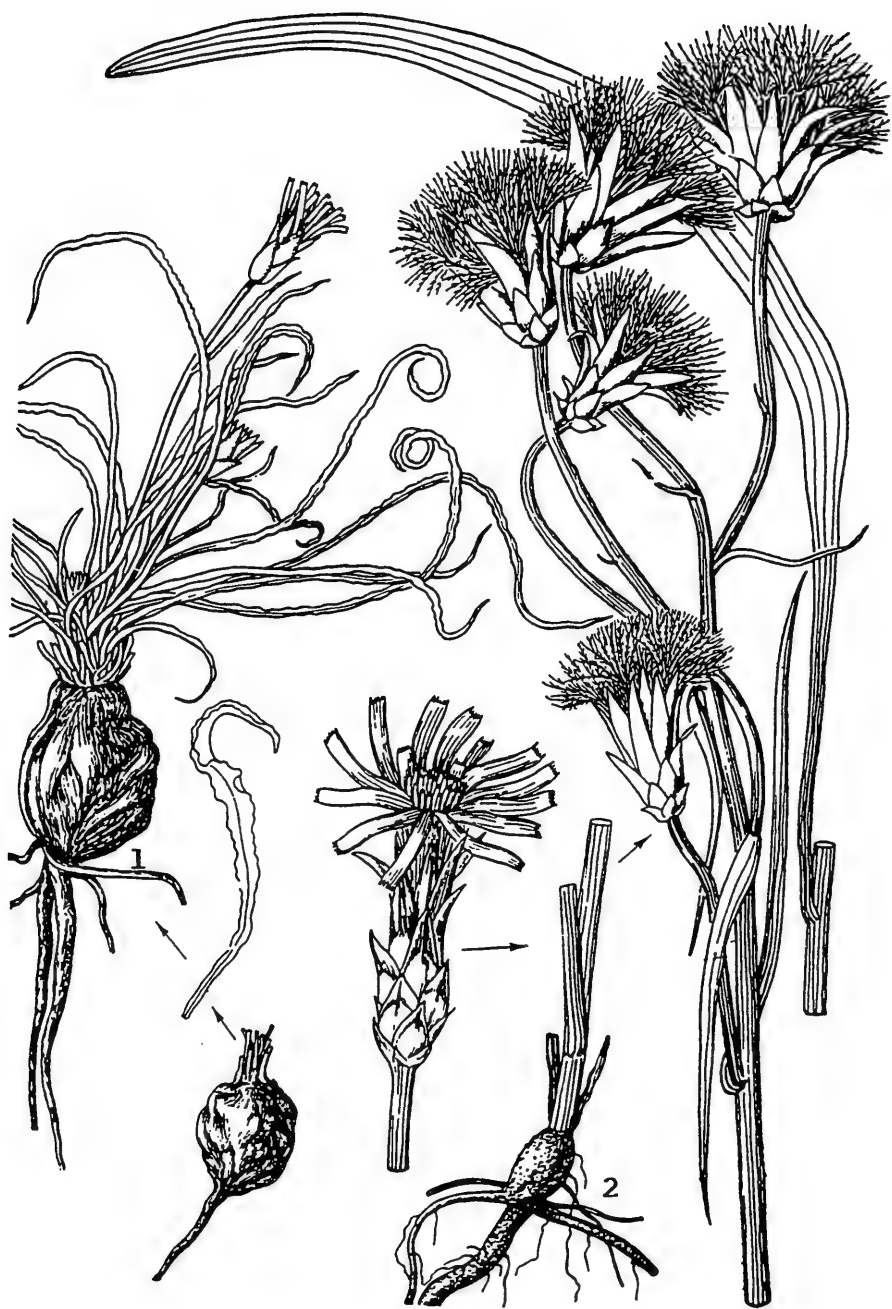
111.—*P. molle* Fisch. and Mey. in Ldb. Fl. ross. II, 2 (1845–1846) 783 quoad pl. Ross. austral., taur. et ciscauc.—*Scorzonera mollis* var. *caulescens* O. Kntze. in Tr. Peterb. Bot. Sada X, 1 (1887) 205.—*Podospermum molle* C.A.M. ex Stank. in Stank. and Tal. Oprel. Vyssh. Rast. (1949) 685.—**lc.**: Bot. Mag. (1830) t. 3027; Lipsch. op. cit. (1935) 26; Fl. Yugo-Vost. VI (1936) 716.—**Exs.**: Callier, Herb. norm. edit. ab Dörfler, No. 4164; Lang and Szovits, Herb. Fl. ruth. No. 77.

Perennial. Arachnoid-canescens, with oval, thick underground tubers; root collar covered with sheaths, sometimes with numerous, somewhat violent, scarios scales. Stems solitary, (7)10–25(35) cm high, more or less pubescent, simple or branched from base, mostly densely leafy throughout, particularly in lower half. Leaves canescent, linear, hard, flat or folded, sometimes slightly undulate, broadened at base, drooping or somewhat arcuately bent, usually with wide midrib; cauline leaves sessile, somewhat amplexicaul, sometimes imbricately overlapping at base of stem. Capitula (1)3–7(12), cylindrical, (2)2.5–3.5 cm long, sometimes on peduncle somewhat thick at base. Involucre pubescent, becoming glabrescent; bracts few, unequal, more or less acuminate; outer bracts small, lanceolate; inner ones oblong-lanceolate, two to two and one-half times as long as outer. Ligulate florets yellow, exceeding involucre. Achenes narrowly cylindrical, stalked; outer achenes tuberculate along longitudinal ribs, scabrous; inner ones weakly 50 tuberculate or smooth; pappus white, soft; pappus bristles plumose, five of them longer, barbed above. Flowering April to June.

Steppes and stony, limestone, gypsum, clayey, and other dry slopes.—*European Part*: Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga; *Caucasus*: Ciscaucasia. *General distribution*: Balkans-Asia Minor. Described from Crimea. Type in Leningrad.

Note. The specimens found from time to time with inconspicuous, scape-like stems correspond to var. *acaulis* O. Kntze. (Tr. Peterb. Bot. Sada, X, 1 (1887) 205); they give the impression of having been grazed by cattle and abnormally developed. In the Askania-Nova steppes, var. *virgata* Lipsch. and Krasch. (Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 75) differs in having thick, distinctly sulcate, 40–45 cm high and 5–7 mm thick stems, numerous virgate, simple, erect, slender branches, wider (6–10 mm wide) leaves with cartilaginous margins, and numerous (12–20 on single plant) capitula.

Series 8. Leptophyllae Lipsch. in Addenda XXVIII, 719.—Stems scape-like, short, leafy only in lower part, less often with solitary leaves, never densely leafy. Tubers nut-shaped, oval or fusiform, at soil surface or deeper. Ligulate florets yellow or red.



14. *S. leptophylla* (DC.) Krasch. and Lipsch. in Lipsch. Fragm. Monogr. Scorzonera I (1935) 78; Grossh. Fl. Kavk. IV (1934) 239; Grossh. Opred. Rast. Kavk. 510; Isaev in Fl. Azerb. VIII, 520.—*S. mollis* var. *leptophylla* DC. Prodr. VII, 1 (1838) 122.—*S. mollis* auct. non M.B.: Fisch. and Mey. Pl. Szow. ined. p. p.—*S. szowitsii* auct. fl. Cauc., pro max. parte.—*S. undulata* auct. non Vahl: Grossh. in Bot. Sborn. Azerb: GNII, I (1932) 53.—*S. turcomanica* auct. non Krasch. and Lipsch.: Grossh. Opred. Rast. Kavk. 510.

Perennial. Plant (3)4–6(10) cm high at flowering, 15–25 cm at fruiting, with nut-shaped tuber borne below root collar near soil surface; roots fibrous, arising from tuber base; root collar covered with remnants of leaf sheath. Stems scape-like, one to three (sometimes up to seven), more or less tomentose, becoming glabrescent, slightly bent, leafy mainly in lower part. Leaves usually longer than stem at flowering, later on at fruiting, much shorter, narrowly linear, (1)2–3 mm wide, acuminate, glaucous or green, mostly pubescent, bent, usually folded lengthwise, 52 less often flat, with cartilaginous margin, with more or less curly hairs. Capitula (one) three to seven, 2–2.5 cm long at flowering, with ligulate florets, 3.5–4 cm long at fruiting, cylindrical. Involucre pubescent, becoming glabrescent; outer bracts ovate-lanceolate, obtuse, inner bracts lanceolate or oblong-lanceolate, longer than outer, usually acuminate; ligulate florets yellow. Achenes stalked, narrowly terete, 14–15(18) mm long, with longitudinal ribs; ribs verrucose, sometimes smooth; pappus grayish, pappus bristles plumose, five of them stiff, long, barbed above, scabrous. Flowering May to June (Plate III, Fig. 1).

Stony-gravelly mountain slopes.—*Caucasus*: Eastern and Southern Transcaucasia. *General distribution*: Iran Afghanistan (northern). Described from Iran (vicinity of Deliman). Type in Leningrad.

15. *S. suberosa* C. Koch in Linnaea XVII (1843) 275; Ldb. Fl. Ross. II, 2, 790; Boiss. Fl. or. III (1875) 761; Grossh. Fl. Kavk. IV (1934) 237; Lipsch. Fragm. Monogr. Scorzonera I, 80; Grossh. Opred. Rast. Kavk. 509.—*S. aucheri* Boiss. and Huet in Boiss. Diagn. pl. or. ser. II, 3 (1856) 92 sec. Boiss. (1875), sp. non vidi.—*S. tuberosa* auct.: Walp. Repert. bot. system. VI (1846–1847) 351, non Pall.—*Podospermum suberosum* (C. Koch) Lipsch. in Fedde, Repert. XXXIII (1933) 168.

Perennial. Resembling previous species; root thickened into oval or oblong tuber near soil surface. Stems (one) two or three (six), scape-like, (6)10–15(28) cm long, pubescent, leafy in lower part, leafless or with isolated reduced leaves above. Leaves linear, pubescent, longer or shorter than stem, flat or folded lengthwise, bent, along margin slightly undulate-crimped, with many veins, midrib mostly wide, white. Capitula

cylindrical (2)2.5–3.5 cm long; involucre pubescent, bracts somewhat scarious along margin, somewhat obtuse or slightly acuminate; outer bracts ovate-lanceolate; inner bracts lanceolate, longer than outer ones. Ligulate florets red, violet when dry. Achenes stalked, cylindrical, 15–18 mm long, with longitudinal ribs; outer achenes tuberculate-toothed along ribs, scarbrous; inner achenes more or less smooth; pappus grayish, pappus bristles plumose, five of them longer, in upper part barbed-scarbrous. Flowering May to June.

Stony-gravelly slopes.—*Caucasus*: ?Eastern Transcaucasia; Southern Transcaucasia. *General distribution*: Armenia and Kurdistan. Described from Somkhetia. Type in Berlin.

Note. From all other species of the subgenus *Pseudopodospermum* found in the USSR, it differs by red (violet in dry condition) flowers.

16. *S. turkeviczii* Krasch. and Lipsch. in Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 83.—**lc.**: Lipsch. *Ibid.* (1935) Plates 30, 31.

Perennial. Plant tomentose, arachnoid at some places, with root thickened into fusiform tuber; root collar more or less covered with leaf sheaths and scales. Stems one to three, scape-like, (4)6.5–12 cm high, pubescent, leafy in lower part. Leaves in type specimen bright green, with many (seven to nine) veins (midrib prominent, white), cartilaginous along margin, more or less distinctly undulate-crimped; basal leaves more or less broadly lanceolate, (4)6–12(16) mm wide, flat or folded, with obtuse callous cusp at apex, and sheathing base surrounding root collar; cauline leaves in lower part of scape-like stem, few, mostly narrowly lanceolate (4–6 mm wide), occasionally broadly lanceolate (10–15 mm wide), sessile, weakly amplexicaul. Capitula cylindrical, 1–1.2 cm wide. Involucre pubescent, of a few bracts scarious along margin; outer involucral bracts ovate, subobtuse; inner ones oblong-lanceolate, subobtuse; ligulate florets yellow. Achenes unknown. Flowering May to June.

Stony, clayey, and limestone slopes.—*Caucasus*: Ciscaucasia (Krasnodar Territory). *General distribution*: eastern Anatolia. Described from former Kars Region. Type in Leningrad.

Note. Our plants belong to a separate variety—var. *kubanica* Krasch. and Lipsch., op. cit.

17. *S. turcomanica* Krasch. and Lipsch. in Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 80.—*S. mollis* auct. fl. turcom. non M.B.—*S. tuberosa* auct. quoad pl. turcom. p. p.—*S. raddeana* auct non Winkl.; Lipsch. in *Fl. Turkm. VII* (1960) 304, p. p.—? *S. stenophylla* Boiss. and Hausskn. ex Lipsch. op. cit. (1935) 80.—**lc.**: Lipsch. op. cit. (1935) Plate 29; Lipsch. op. cit. (1960) Plate XLVI, Fig. 1.

Perennial. Whole plant farinose; root gradually thickened into tuber, sometimes spherical; root collar densely covered with sheaths of basal leaves, partly incised but not fibrous. Stems numerous, scape-like, 10–20 cm high, leafy only in lower part. Leaves filiform, narrowly linear, 1–2 mm wide, bent or drooping, farinose, flat or rolled, entire, with callose thickening at apex, acuminate, mostly longer than often leafy stem. Capitula 6–10(19), mostly narrowly cylindrical, (2)2.5–3.5 cm long. Involucre tomentose, becoming glabrescent; outer bracts ovate-lanceolate; inner lanceolate, two to two and one-half times as long as outer; all bracts somewhat scarious on margin, obtuse. Ligulate florets yellow. Achenes on small stalk, cylindrical, with longitudinal ribs, acerate along ribs; pappus dirty gray or blackish, its bristles plumose to three quarters length, barbed above. Flowering April to May.

Steppes and stony and marly slopes.—*Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Iran (northern), Afghanistan. Described from Kopetdag. Type in Leningrad.

Note. See note on *S. raddeana* Winkl.

- 54 18. ***S. raddeana*** Winkl. in Tr. Peterb. Bot. Sada XI, 1 (1890) 150; Lipsch. in Fl. Turkm. VII, 304, p. p.—**lc.**: Winkl. op. cit. t. III, fig. 1, a; Lipsch. op. cit. Plate XLVI.

Perennial. Plant slightly arachnoid and canescent; root apparently thickened into tuber; root collar densely covered with brownish sheaths of basal leaves. Stem 25 cm high, in form of leafy sulcate scapes, branched almost from base. Leaves linear, up to 5 cm wide, acuminate; basal leaves broadened into sheaths; cauline semiamplexicaul; all leaves along margin weakly undulate-crimped; peduncles slightly exceeding leaves. Capitula large (3.5 cm long and 1.5 cm wide in fruits), solitary, terminal on branches. Involucre arachnoid pubescent; bracts unequal, margin white-membranous. Ligulate florets red, on drying lilac-colored (needs to be confirmed in nature). Achenes terete, brown, ribbed, densely spiny, without swollen stalks; pappus dirty gray or blackish, almost as long as achene; pappus bristles stiff, plumose almost to three quarters of their length, in upper part toothed-scabrous. Flowering April to May.

Gravelly desert.—*Soviet Central Asia*: Mountainous Turkmenia (between Khodzha-Kala and Bami). Endemic. Described from the place indicated above. Type in Leningrad.

Note. Only one specimen of this species is known—the authentic specimen; the species has never been collected subsequently. It is quite close to *S. turcomanica* Lipsch. and Krasch., from which it is distinguished by having broader leaves, a scapelike but leafy stem that is branched from the very base, red (needs verification in nature from living material) ligulate florets, and achenes without stalks. In the *Flora of Turkmenia*

(VII, p. 304), I united *S. raddeana* C. Winkl. with *S. turcomanica* Krasch. and Lipsch. into a single species, under the first (priorable) name. However, this question cannot be completely resolved. Therefore, in the present work, with the aim of drawing attention to both taxa, they are treated as separate entities, which are presented in the identification key and in the text. Compare my note in the *Flora of Turkmenia* (p. 306).—This species is included tentatively under the subgenus *Pseudopodospermum*. Although it does not have a stalked achene, it is close to the members of the subgenus in other characters.

Subgenus III. Scorzonera.—*Euscorzonera* Rouy, Fl. Fr. X (1908) 9; Consp. Fl. Fr. (1927) 169; Lipsch. Fragm. Monogr. Scorzonera II (1939) 9.—Subgen. *Euscorzonera* Lipsch. Fragm. Monogr. Scorzonera I (1935) 7.—Gen. *Scorzonera* Cass. in Dict. sc. nat. XXV (1822) 63, 264; Rchb. Fl. Germ. exc. (1830) 275; Endlich. Gen. pl. (1838) 497; Benth. and Hook. f. Gen. pl. II (1873) 531 (excl. sect. *Pterachaenia* and *Podospermum*); Boiss. Fl. or. III (1875) 755–783, excl. sect. *Podospermum* (pp. 757–760) and *Epilasia* (pp. 781–783); O. Hoffm. in Pflanzenfam. IV, 5 (1893) 365, excl. sect.: *Pterachaenia* Benth., *Podospermum* DC. and *Epilasia* Bge.—*Achyroseris* Sch. Bip. in Nov. Act. Acad. Caesar. Leopold.-Car. Natur. Cur. XXI, 1, (1845) 165.—*Scorzonerae* sect. 1a Less. Synops. Compos. (1832) 134.—Sect. *Euscorzonera* DC. Prodr. VII, 1 (1838) 117; Ldb. Fl. Ross. II, 2 (1845–1846) 790, p. p.; Boiss. Fl. or. III (1875) 760–776, p. p.—*Fleischeria* Hochst. and Steud. ex Endlich. Gen. 55 pl. (1838) 497.—*Gelasia* Cass. in Bull. Soc. Philom. Paris (1818) 33 (opusc. non vidi); in Dict. sc. nat., XVIII (1820) 285; XLII (1826) 81; Less. Synops. Compos. (1832) 134 (sub nom. *Galasia*); W. Koch. Synops. Fl. Germ. et Helv. (1837) 426, pro genere; DC. Prodr. VII, 1 (1838) 123, pro sect.; Endlich. Gen. pl. (1838) 497, pro gen. *Galasia*.—*Lasiospora* Cass. in Dict. sc. nat. XXV (1822) 306; Less. Synops. Compos. (1832) 134; DC. Prodr. VII, 1 (1838) 124, pro sect.; Ldb. Fl. Ross. II, 1 (1845–1846) 796, pro sect.; Sch. Bip. op. cit. (1845) 166, pro gen; Boiss. Fl. or. III (1875) 776–781, pro sect.—*Lasiospermum* Fisch. Catal. Hort. Gorenk. (1812) 34, non Lag.—*Polyclada* DC. Prodr. VII, 1 (1838) 125, pro sect.

Achenes without hollow swollen stalks at base. All leaves simple, entire, sometimes pinnatifid only in *S. bicolor*. Involucral bracts not corniculate at apex. Achenes glabrous or lanate.

Type of subgenus: type of genus.

Section 1. Incisae Lipsch. in Lipsch. Fragm. Monogr. Scorzonera 1 (1935) 91.—Plant with pinnatifid or pinnatisect leaves. Leaves quite variable in degree of cutting, in several species with serrate margin.

Flowers bicolorous: ligule yellow, blackish-purple near base. Achenes without stalks, white or flesh-colored, ribbed (ribs corky), sulcate.

19. **S. bicolor** Freyn and Sint. in Oesterr. Bot. Zeitschr. XLIII (1892) 266; Lipsch-Fragm. Monogr. *Scorzonera* I (1935) 102; Grossh. Opred. Rast. Kavk. 510; Isaev in Fl. Azerb. VII, 521.—*S. incisa* var. *dentata* Bordz. in Zap. Kiev. Obshch. Estestv. XXV, 1 (1915) 131; Grossh. Fl. Kavk. IV (1934) 238.—*S. karjaginii* Grossh. in Bot. Sborn. Azerb. GNII I (1932) 52, descr. ross.; Tr. Azerb. Otd. Zakavk. Fil. Akad. Nauk SSSR, Sek. Bot. I (1933) 62, descr. latin; Fl. Kavk. IV (1934) 238.—**lc.**: Lipsch. op. cit. (1935) Plates 38, 39.

Perennial. Plant arachnoid-pubescent, later glabrescent, with vertical root; root collars covered with numerous hard, glossy, partly torn sheaths. Stems 30–50 cm high, pubescent, later glabrescent, erect or somewhat ascending, solitary or a few (three to five), sulcate, leafy, branched in upper part. Leaves hard, pubescent, with distinct midrib, more or less carinate beneath, margin cartilaginous, variously incised; basal leaves numerous, narrowed into long sulcate petiole, oblong-lanceolate, lamina 15–20 cm long and 3 cm wide, sharp-toothed, pinnatifid or less often entire; upper cauline leaves highly reduced, sessile, amplexicaul, oblong-lanceolate or lanceolate, toothed or incised, with obtuse auricles at base. Capitula large, on long peduncles, 2–2.5 cm long and 0.8–1 cm wide at flowering, up to 4 cm long and 2 cm wide at fruiting. Involucre of imbricate, glabrous, hard bracts more or less scarious along margin; outer
56 bracts ovate-deltoid; inner ones oblong-lanceolate, two to four times as long as outer ones. Florets and ligules yellow, corolla throat black-purple. Outer achenes 15–20 mm long, white or flesh-colored, with corky ribs, deeply sulcate, with obtuse teeth along ribs, basally fused outer achenes often not filled, flattened; pappus dirty white, 18(25) mm long, pappus bristles stiff, plumose, barbed above. Flowering June to August.

Stony gravelly slopes.—*Caucasus*: Southern Transcaucasia. *General distribution*: Armenia and Kurdistan. Described from Turkey. Type in Freyn's herbarium.

Section 2. Purpureae Lipsch. in Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 104.—Root collar densely hairy. Stem mostly up to 80 cm high, simple or branched, with one to five capitula, usually densely leafy. Achenes glabrous, somewhat swollen at base. Inner involucre bracts subobtusate, distinctly white-membranous along margin. Florets pink, red or violet.

20. **S. purpurea** L. Sp. pl. (1753) 791; Willd. Sp. pl. III, 3 (1803) 1502, descr. emend.; M.B. Fl. taur.-cauc. II, 236; DC. Prodr. VII, 1, 118;

Ldb. Fl. Ross. II, 2, 791, p. max. p.; Boiss. Fl. or. III, 768; Schmalh. Fl. II, 142; Kryl. Fl. Alt. III, 731; Syreistsch. III. Fl. Mosk. Gub. III, 328; Hegi, Ill. Fl., IV, 2 (1929) 1054; Krasch. in Fl. Yugo-Vost. VI, 452; Lipsch. Fragm. Monogr. Scorzonera II, 106; Kryl. Fl. Zap. Sib. XI, 2987.—*S. purpurea* subsp. *eupurpurea* Herrm. in Hegi, op. cit. (1929) 1054.—*Podospermum purpureum* Koch ex Steud. Nomencl. bot. ed. 2, II (1841) 546.—**lc.**: Rchb. Ic. Fl. Germ. XIX, t. 1382; Syreistsch. op. cit. 328; Hegi, op. cit. t. 276, fig. 3; fig. 737, 738, 746. **Exs.**: GRF No. 1622.

Perennial. Root vertical, cylindrical, root collar densely setose with remnants of petioles. Stems (8)15–45(80) cm high, solitary or a few, glabrous, arachnoid at isolated places, especially below capitula or at leaf base, simple (and then with single capitulum) or branched above, with two to five solitary terminal capitula. Leaves narrowly linear, herbaceous, 1–3(4) mm wide, entire, triangular-grooved, glabrous or weakly arachnoid-pubescent; basal leaves 5–25 cm long, somewhat narrowed at base, with more or less densely pubescent sheaths; cauline leaves usually many (five to seven), sessile, somewhat broadened at base. Capitula medium-sized; up to 2.5 cm long and 0.4–1 cm wide. Involucre oblong-cylindrical, almost glabrous or slightly pubescent mainly in lower part; outer involucre bracts 58 ovate, often with brown border along margin; inner bracts two times as long as outer ones, margin scarious, lanceolate, obtuse. Ligulate florets light purple or violet-pink, with vanilla flavor, one and one-half to two times as long as involucre. Achenes up to 12 mm long, glabrous, with ring of hairs only below pappus, ribbed, ribs smooth; pappus bristles plumose. Flowering May to June. (Plate IV, Fig. 1.)

Steppes, wet and steppe meadows, grassy slopes, sands, edges of steppe pine forests, gravel and limestone slopes.—*European Part*: Black Sea Region, Middle Dnieper, Baltic Region, Volga-Don, Upper Volga, Volga-Kama, Trans-Volga, Lower Don; *Western Siberia*: Upper Tobol, Irtysh; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region. *General distribution*: central Europe, Mediterranean. Balkans-Asia Minor. Described from central Europe. Type in London.

21. *S. rosea* Waldst. and Kit. Descr. pl. rar. Hung. II (1805) 127; Willd. Sp. pl. III, 3, 1502; DC. Prodr. VII, 1, 118; Boiss. Fl. or. III, 769, p. min. p.; Hegi, Ill. Fl. VI, 2 (1929) 1055; Lipsch. Fragm. Monogr. Scorzonera II, 108.—*S. purpurea* β . *rosea* Ldb. Fl. Ross. II, 2 (1845–1846) 792.—*S. purpurea* ssp. *rosea* (Waldst. and Kit.) Herrm. in Hegi, op. cit. (1929) 1055.—**lc.**: Waldst. and Kit. op. cit. (1805) t. 121; Rchb. Ic. fl. Germ. XIX, 1382; Hegi, op. cit. (1929) 1056, fig. 739; Javorka and Csapody, Magyar Fl. Képekben, f. 556, No. 4000 (*nigra*), t. XL (color).



Perennial. Root fusiform-cylindrical; root collar covered with numerous blackish-brown hairs. Stems 15–60 cm high, erect or ascending, simple (very rarely branched near base and then with single branch) with single capitulum. Leaves lanceolate to linear-lanceolate, 3.5–4 mm wide, flat, glabrous; basal leaves often as long as stem; cauline leaves much shorter. Capitula large, up to 5 cm long in full bloom; involucre oblong-cylindrical, 2–3 cm long, weakly lanate at base; involucral bracts 16–20; outer bracts deltoid, oblong, obtuse, scarious along margin; inner bracts two to three times as long as outer, lanceolate, obtuse, mostly with brown spot. Florets pale-pinkish, peripheral ones two times as long as involucre. Achenes 15 mm long, pale yellow or pale reddish-brown, ribbed, ribs in upper part toothed-scabrous; pappus plumose. Flowering June to July.

Alpine and subalpine meadows, open woodlands and scrubs, limestones.—*European Part*: Upper Dniester (Carpathians). *General distribution*: central Europe, Mediterranean, Balkans-Asia Minor. Described from Hungary. Type in Budapest; isotype in Leningrad.

Note. This is a montane race giving rise to a series of transitions to *S. purpurea*. The type specimen of *S. rosea* differs from *S. purpurea* by having wider, flat leaves, larger capitula, a larger number of involucral bracts and ribs on the achenes, these being toothed-scabrous in the upper part. In the Carpathians, it is a typical plant of the subalpine meadows, also extending into the alpine zone.

- 59 *Section 3. Egregiae* (Kult.) Lipsch. Comb. n.—§ (subsect.) *Egregia* Kult. Tau-Sagy i E'kol. Osnovy Vvedeniya Ego v Kulture* (1938), 108.—Subgen. *Egregia* (Kult.) Ovcz. in Soobshch. Tadj. Fil. Akad. Nauk SSSR XX (1949) 54.—Semishrubs, forming hemispherical tussocks. Nonspiny. Elastic latex fibers distinctly visible on breaking underground organs. Stems (caudices) never hard-woody; current year's stems not producing rosettes, simple or less often weakly branched. Achenes terete, ribbed, along ribs more or less tuberculate-scabrous, pubescent. Pappus white, pappus bristles plumose, inner bristles longer, barbed above. Capitula many-flowered.

22. *S. tau-saghyz* Lipsch. and Bosse. in Tr. N.-I. Labor. Tresta "Kauchuknos," 4 (1930) 27; Tr. N.-I. Inst. Promyshl. 465 (1931) 5; Lipsch. sistem. Zam. ob Aziat. Skorts. (1932) 11; Lipsch. Fragm. Monogr. Scorzonera I (1935) 18; Kult. Tau-Sagy i E'kol. Osnovy Vvedeniya Ego v Kul'ture (1938) 61.—*S. vavilovii* Kult. in Kult. op. cit. (1938) 56.—*S. mariae* Kult. in Kult. op. cit. (1938) 59.—*S. karataviensis* Kult. in

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Kult. op. cit. (1938) 66.—*S. longipes* Kult. in Kult. op. cit. (1938) 70.—*S. kirghisorum* Afan. in Tr. Tadzh. Bazy Akad. Nauk SSSR, VIII, 1938 (1940) 474.—*S. tadshikistanica* Ovcz. in Soobshch. Tadzh. Fil. Akad. Nauk SSSR XII (1949) 8, nomen.—*S. rindak* Ovcz. in Soobshch. Tadzh. Fil. Akad. Nauk SSSR XX (1949) 53 in adnot.—*S. usbekistanica* Czevenidi and Bondarenko in Dokl. Akad. Nauk Uzb. SSR 3 (1950) 37, nomen; Galkina in Tr. Inst. Bot. Akad. Nauk Uzb. SSR I (1932) 5–23 (detailed description of species in Russian); Kovalevskaja in Fl. Uzb. VI (1962) 436 and Appendix, 516 (descr. lat.).—**lc.**: Lipsch. and Bosse, op. cit. (1931) Plates 1 and 2 (color); Kult. op. cit. (1938) Figs. 1, 29, 39, 44, 49, 55, 60, 73; Fl. Uzb. VI (1962) Plate XLIV, Fig. 2.

Perennial. Semishrub forming loose or somewhat compact hemispherical tussocks; whole plant more or less sericeous with simple flexuous hairs, glabrescent; but sometimes bases of fallen hairs visible. Rhizome strong, deeply embedded in soil, strongly branched above, many-headed, forming tussock of intertwined underground stems, terminating above soil surface in rosettes of more or less numerous (6–25) basal leaves and erect, somewhat flexuous, 3 to 165 flowering shoots. Thin elastic latex fibers distinctly visible in laticifers on breaking roots and underground stems; latex milky-white or yellowish-green; aerial stems densely covered with numerous imbricate, grayish-brown, weakly glossy, rigid, basally broadened into deltoid, fibrous sheaths of dried and partly torn leaves of previous years. Leaves of rosette (6–25) broadened at base into sheaths, grayish-green, variable, narrowly linear, with reddish-brown subulate apex, often uncinat, distinctly triquetrous below, somewhat flat above, often incurved, carinate, or fistular, narrowed at both ends, roundish in cross section, or subulate-edged, carinate-subulate; all leaves coriaceous, three- to five-veined, with broad light yellow midrib beneath; sheaths not green, yellowish-brown, glossy, dorsally smooth or roundish-carinate, with dense tuft of simple multicellular hairs, initially white, later rusty; up to eight parallel reddish-brown veins visible at base of leaf sheath. Flowering shoots erect, developing every year (one to three) from base of leaf rosette, drying out and falling after fruiting, 5–40 cm long, with 7–23 leaves, longer than rosette leaves, sulcate, sometimes fistular, simple, with single capitulum, or branched, with two to four capitula; clavately thickened or not below capitula; cauline leaves alternate; all leaves somewhat broadened at base; lowermost leaves scarious, scaly, aristate-acuminate; middle cauline leaves mostly flat, sometimes carinate, somewhat divergent; upper leaves reduced, bent, filiform, hairy. Capitula solitary or in groups of a few, cylindrical, obconical or pyriform, (1.3)2.3–4(4.5) cm long; involucre many-rowed (three to six), with 15–70 bracts; involucral bracts imbricate, highly unequal in shape, size, pubescence, and color; outer and middle

bracts shorter, deltoid or lanceolate, more or less carinate, sometimes crestate, some bracts with callose, mildly serrate, tuberculate thickening in upper part of keel; inner bracts longest (up to 2.2 cm), oblong-lanceolate to linear, obtuse or somewhat acuminate, with scarious margin, mostly without keel or with barely visible keel toward apex, or more or less pubescent. Ligulate florets more or less numerous (30–50 in capitulum), yellowish with dark red veins (turning red from outside on drying), longer than involucre; sparse tuft of white hairs in upper part of corolla tube on outside near base of ligule. Achenes terete, 6–14 mm long, with 10 ribs, ribs smooth or tuberculate-scabrous, sometimes with sharp spinules, usually densely pubescent; pappus snow-white, its bristles plumose, inner bristles 4–6(10), longer and fragile, toothed above. Flowering May to July.

Sony gravelly northern slopes and plateaus, clayey ridges (Karatau Range); slopes of adyrs (Fergana); steep north-facing slopes at 1,900–2,100 m (Turkestan Range).—*Soviet Central Asia*: Syr-Darya (Karatau Range); Pamiro-Alai (Fergana valley, Turkestan and Hissar ranges). Endemic. Described from Syr-Darya Karatau. Type in Moscow.

Note. An unusually polymorphic species, extremely variable in the shape and width of leaves, consistency and number of leaves in the rosettes, size, shape, pubescence and color of the involucre bracts, nature of the pubescence and achene sculpture, structure of the pappus hairs, etc. The division of tau-sagyz into a large number of smaller species is not at all convincing to me, because the characters given as the basis for separating them, with the variety of ecological conditions in which tau-sagyz is found and its fragmented range are of an intermediate, unstable nature. Capable of regeneration. Tau-sagyz, a well-known rubber producing plant, has generated a voluminous literature in the USSR; it has been introduced into cultivation.

The study of the specimens of *Scorzonera acantholimon* Hand.-Mazz., collected in Turkey and kindly sent to me by Davis from Edinburgh, showed that this species, which was earlier considered close to *S. tau-saghyz* Lipsch. and Bosse, has nothing in common genetically with the latter. The types of the species described by M.V. Kultiasov are preserved in Leningrad. The type of *S. kirghisorum* Afan. is also there. The type of *S. rindak* Ovcz. is in Dushanbe, and that of *S. uzbekistanica* Czevr. and Bond. in Tashkent.

Section 4. Piptopogon C.A.M. ex Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 97 (Fl. baic.-dahur.); Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 66 (descr. emend.).—Gen. *Achyroseris* Sch. Bip. in Nov. Acta Acad. Caes. Leopold.-Carol. Nat. Cur. XXI (1845) 165.—Sect. *Macrospermae* Nakai in Report. Inst. Sc. Res. Manch. I, 6 (1937) 168, in adnot.—Capitula large, especially in fruiting plants, (3.5)5–8 cm long

and (1)1.5–2(3) cm wide. Achenes elongate, (2)4–4.5 cm long, apex narrowed into a beaklike structure. Involucre many-rowed; outer involucral bracts reduced, ovate-deltoid; inner ones linear-lanceolate, usually rather long (up to 6 cm); pappus dirty-yellow, usually falling off entirely. Ligulate florets yellow and pink, resembling *Tragopogon* species in external appearance.

Series 9. Macrospermae Lipsch. in Addenda XXVIII, 719.—Ligulate florets yellow.

23. *S. albicaulis* Bge. in Mém. Acad. Sc. Pétersb. div. sav. II (1835) 114; DC. Prodr. VII, 1, 117; Maxim. in Bull. Acad. Sc. Pétersb. XXXII, 4 (1888) 495; Konl. and Alis. Oprod. Rast. Dal'nevost. Kr. II, 1091; Lipsch. Fragm. Monogr. Scorzonera II, 75.—*S. albicaulis* Bge. f. *rosea* Nakai and *flavescens* Nakai in Report. Inst. Sc. Res. Manch. I, 6 (1937) 169.—*S. macrosperma* Turcz. in DC. Prodr. VII, 1 (1838) 121, descr.; in Bull. Soc. Nat. Mosc. XI, 1 (1838) 95, nomen. XXI, 3 (1848) 97 (Fl. baic.-dahur.) descr.; Ldb. Fl. Ross. II, 2, 795; Maxim. Prim. fl. amur. 177; Rgl. Tent. Fl. Ussur. 302; Nakai, op. cit. (1937) 169.—*Piptopogon macrospermus* C.A.M. ex Turcz. in Bull. Soc. Nat. Mosc. XI, 1 (1838) 95, nomen; Sch. Bip. in Nov. Acta Acad. Caesar. Leopold.-Carol. Nat. Cur. XXI (1845) 165.—*Achyroseris macrosperma* Sch. Bip. op. cit. (1845) 166.—? *S. radiata* β. *linearifolia* DC. Prodr. VII, 1 (1838) 122.—*lc.*: Nakai op. cit. (1937) t. II and III.

- 62 Perennial. Root collar covered with reddish-brown sheaths of previous year's leaves. Stems up to 1 m high, erect, fistular, sulcate, floccose, later almost glabrous. Leaves flat, linear or broadly linear, acuminate, five- to seven-veined, glabrous or weakly pubescent, serrulate under hand lens; basal leaves up to 0.4 m long, 0.7–1.8(2) cm wide; cauline leaves similar to basal leaves in shape and size, sessile, slightly broadened at base, amplexicaul, reduced in size above. Capitula in umbellate corymb (f. *umbellata* Lipsch.) or on lateral peduncles, cylindrical, up to 4.5 cm long and 1–1.2 cm wide at flowering. Involucre many-rowed, arachnoid-pubescent or almost glabrous; outer bracts deltoid-ovate, smaller, middle obovate, somewhat acuminate; inner ones linear-lanceolate, somewhat scarious along margins, obtuse or somewhat acuminate, two times as long as middle ones. Ligulate florets yellow, pinkish when dry, almost one and one-half times as long as involucre. Achenes large, up to 2.5 cm long when mature, reddish-brown, gradually tapered toward apex to form beak, with somewhat sharp ribs; pappus dirty-yellow, deciduous, pappus bristles plumose, connate at base into ring, five of them long, sharp-pointed, barbed above. Flowering July to August (Plate III, Fig. 2.)



Dry meadows, thin evergreen forests, scrub, and wastelands.—*Eastern Siberia*: Dauria; *Far East*: Zeya-Bureya, Ussuri, Uda Region. *General distribution*: northeastern China, Korean Peninsula. Described from northern China (*S. albicaulis* Bge.) and Nerchinsk Dauria (*S. macrosperma* Turcz.). Type in Leningrad.

Series 10. Bracteosae Lipsch. in Addenda XXVIII, 720.—Capitula surrounded by more or less large adnate bracts. Leaves broadly lanceolate or ovate-lanceolate, 2.5–4 cm wide.

24. ***S. bracteosa*** Winkl. in Tr. Peterb. Bot. Sada XI, 2 (1890) 324; Lipsch. Fragm. Monogr. Scorzonera II (1939) 68; Kovalevskaja in Fl. Uzbek. VI, 438.—*S. inula* Lipsch. in Lipsch. Sistem. Zam. ob Aziat. Skorts. (1932) 19; Lipsch. in Fedde, Repert. XXXIII (1938) 166.—**lc.**: Lipsch. op. cit. (1933) 33, Fig. 9 (sub nom. *S. inula*); Lipsch. op. cit. (1939) Plate 11.

64 Perennial. Plant (10)15–60 cm high, with one or many stems. Stems sulcate, more or less pubescent, glabrescent, usually with corymbose branching, sometimes sparsely leafy, and then internodes long. Leaves pubescent or glabrescent, with many (up to seven) veins, hard, serrulate under hand lens, flat or slightly repand; basal leaves 2.5–3.0 cm long, narrowed into long petiole, with somewhat broadened sheath; cauline leaves gradually reduced above, alternate or almost opposite, broadly lanceolate, (1)2–4 cm wide, amplexicaul; bracteal leaves (1)2–7 cm long, appressed to base of capitulum, variable in number (one to four) and size, similar to upper cauline leaves (i.e. also ovate-lanceolate or less often lanceolate), sometimes exceeding capitula. Capitula (2)5–8(15), 5.5 cm long at flowering, up to 8 cm long and up to 3.5 cm wide at fruiting. Involucre somewhat pubescent; outer bracts reduced, (0.3)0.5–0.6 cm long, deltoid-ovate, sometimes somewhat carinate; middle ones 2–3(3.5) cm long, oblong-lanceolate; inner ones 4–5(7) cm long, linear-lanceolate. Ligulate florets yellow. Achenes up to 4 cm long, brownish-red when mature, narrowed above into beak, scabrous on ribs or almost smooth; pappus dirty-yellow, deciduous, its bristles up to two-thirds plumose, barbed above. Flowering June to July.

Stony steppe slopes, screes of conglomerates, etc.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Hissar. Type in Leningrad.

25. ***S. alaica*** Lipsch. in Lipsch. Fragm. Monogr. Scorzonera II (1939) 71.

Similar to the preceding species in external appearance, shape and size of vegetative and reproductive organs. Distinguished by pink ligulate florets and reduced bracts. Flowering June.

Soviet Central Asia: Pamiro-Alai (Alai Valley, Gulcha). Endemic. Described from Alai. Type in Leningrad.

Note. Described from three herbarium sheets collected by V.A. Tranzshel. The available material shows a clear difference between this Alai race and *S. bracteosa*; however, additional field observations of this race are needed.

Series 11. *Tragopogonoideae* Lipsch. in Addenda XXVIII, 720.—Capitula not surrounded by somewhat large adnate bracts. leaves linear or broadly linear, herbaceous, up to 2 cm wide. Ligulate florets pink.

26. *S. albertoregelia* Winkl. in Tr. Peterb. Bot. Sada, XI, 2 (1890) 322; Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 68; Kovalevskaja in Fl. Uzb. VI, 437 (pro syn. *S. tragopogonoides* Rgl. and Schmalh.).—**lc.**: Lipsch. in Byull. Mosk. Obshch. Isp. Prir., Otd. Biol., XLII, 2 (1933) 155, Fig. 2; Lipsch. op. cit. (1939) Plate 10.

Perennial. Dwarf plant, 2–3.5 cm high. Stems prostrate, numerous (up to 10). Leaves narrowly linear, 0.2 cm wide, glaucescent, glabrous, or somewhat pubescent, serrulate under hand lens, mostly three-veined.
65 Capitula large, 4–4.5 cm long, one and one-half to two times as long as stem. Involucre arachnoid-tomentose; outer involucral bracts deltoid, 7.5–8 mm wide, with uncinat apex; inner bracts linear-lanceolate, 4 cm long, more or less broadly membranous along margin. Ligulate florets pink or light violet(?). Achenes 2.5 cm long, reddish-brown, narrowed above into beak; pappus dirty yellow, wholly deciduous, pappus bristles up to two-thirds plumose, barbed above, scabrous. Flowering August.

Soviet Central Asia: Pamiro-Alai (Karategin). Endemic. Described from Karategin. Type in Leningrad.

Note. The species was described by Winkler from a single specimen; it has never been collected again and requires additional study. Possibly, the most typical characters of *S. albertoregelia*—numerous dwarf stems and capitula exceeding the stems—indicate that the specimen used for describing this species was regenerated from a plant grazed by cattle (?*Scorzonera tragopogonoides*).

27. *S. tragopogonoides* Rgl. and Schmalh. in Tr. Peterb. Bot. Sada, V (1877) 635; Lipsch. Sist. Zam. ob. Aziat. Skorts. (1932) 22; Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 82; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 93; Lipsch. in Fl. Turkm. VII, 307; Kovalevskaja in Fl. Uzb. VI, 437, p. max. p.—*S. glabra* Winkl. in Tr. Peterb. Bot. Sada, XI, 2 (1890) 323.—*S. korshinskyi* Lipsch. op. cit. (1932) 18; Lipsch. in Fedde, Repert. XXXIII (1933) 165.—*S. nikitini* Lipsch.

op. cit. (1932) 20; Lipsch. op. cit. (1933) 166.—*S. crassicaulis* Rech. f. in Symb. Afghan. II (1955) 191.—**lc.**: Lipsch. op. cit. (1939) Plate 15, 16; Rech. f. op. cit. (1955) fig. 133.

Perennial. Plant 20–60 cm high, with fusiform root; root collar covered with remnants of previous year's leaves. Stems solitary, erect, sulcate, pubescent, glabrescent, more or less densely leafy. Leaves flat or folded, herbaceous, narrowly or broadly linear, 0.1–0.8 cm wide, many-veined, serrulate under hand lens, scabrous; basal leaves somewhat broadened into sheaths; cauline leaves sessile, somewhat broadened at base, amplexicaul, all leaves acuminate. Capitula axillary, at variable height, not forming candelabrumlike corymbose inflorescence; peduncles clavately thickened below capitula, decorated with small membranous leaves. Capitula 5–5.5 cm at flowering, up to 6–6.5 cm long at fruiting. Involucre cylindrical, many-rowed, imbricate, with fine arachnoid pubescence; involucre bracts often with distinct carinate midrib; outer bracts small, deltoid or deltoid-ovate, usually acuminate, sometimes with falcate cusp; middle ones ovate-deltoid or lanceolate, almost two times as long as outer; inner ones linear-lanceolate, membranous along margin, largest up to 6 cm long (in fruits). Ligulate florets pink. Achenes up to 3.5 cm long, narrowed into beak, scabrous above, reddish on maturity; pappus dirty-yellow, wholly deciduous, pappus bristles connate at base, plumose, barbed above. Flowering June to August.

Stony and clayey steppe slopes—*Soviet Central Asia*: Syr-Darya (Karatau), Tien Shan, Pamiro-Alai (including Shugnan). *General distribution*: Afghanistan. Described from cultivated specimens raised from seed in the Petersburg Botanical Garden. Type in Leningrad.

Note. In the opinion of Popov, this wonderful species represents a hybrid between *Tragopogon ruber* and *S. inconspicua*(?). To me this opinion appears to be unfounded. The Kazakhstan specimens differ by having narrower light green or glaucous leaves, densely leafy stems, and a xerophilous appearance (*S. tragopogonoides* ssp. *sclerophylla* Krasch. and Lipsch.).

28. ***S. petrovii*** Lipsch. in Lipsch. Sist. Zam ob Aziat. Skorts. (1932) 20; Lipsch. in Fedde, Repert. XXXIII (1933) 167; Pavlov in Tr. po Prikl. Bot. Ser. 1, 2 (1937) 287; Lipsch. Fragm. Monogr. Scorzonera II (1939) 79; Kovalevskaja in Fl. Uzb. VI, 437.—**lc.**: Lipsch. op. cit. (1932) 35, Fig. 11; Pavlov in Zhurn. "Sov. Kauchuk", 3 (1932) 27; Lipsch. op. cit. (1939) Plate 13.

Perennial (? biennial). Plant 10–30 cm high; root collar covered with brown remnants of leaf sheaths. Stem terminating in more or less compressed candelabrumlike, corymbose inflorescence; branches of

inflorescence arcuate, densely leafy. Basal leaves herbaceous, narrowly linear, 0.2–0.4 cm wide, flat or partly incurved, glaucous-green, somewhat pubescent, with distinct, white, hyaline midrib beneath (width highly variable), somewhat arcuate, sometimes significantly exceeding stem (with inflorescence). Capitula solitary on all branches of corymbose inflorescence, 3.5–6.5 cm long, including ligulate florets. Involucre slightly arachnoid-pubescent, many-rowed, involucre bracts unequal; outer bracts deltoid-triangular, smaller; middle ones ovate-deltoid, somewhat narrowed above, broadly scarious along margin, two times as long as outer ones; inner ones linear-lanceolate, much longer than outermost. Ligulate florets pink. Achenes up to 3.5 cm long, glabrous, narrowed above into beak, with smooth or scabrous ribs, reddish when mature; pappus dirty yellow, deciduous; pappus bristles connate at base into a ring, plumose, glabrous at apex, barbed. Flowering June to July.

Stony and gravelly mountain slopes.—*Soviet Central Asia*: Syr-Darya (Karatau Range), Tien Shan (western). Endemic. Described from Karatau. Type in Moscow.

29. ***S. baldshuanica*** Lipsch. in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLII, 2 (1933) 154; Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 80; Kovalevskaja in Fl. Uzb. VI, 437 (pro syn. *S. tragopogonoides* Rgl. and Schmalh.).—**lc.**: Lipsch. op. cit. (1933) 155, Fig. 1; Lipsch. op. cit. (1939) Plate 14.

Perennial. Plant small, 5–9(13) cm high, glaucescent, pubescent plant. Root collar covered with brown sheaths of basal leaves. Stem solitary, slightly inclined, sulcate, usually dark red, partly arachnoid-pubescent with three to five flowering shoots above. Leaves pubescent, glabrescent, flat or folded; basal leaves up to 15 cm long, herbaceous, linear, narrow, 0.1–0.2(0.5) cm wide, at base somewhat broadened into sheaths; cauline leaves reduced, often undulate-crimped along margin. Capitula three to five, on short, usually tomentose peduncles, cylindrical, 3–3.5 cm long at flowering, up to 5 cm in early fruiting. Involucre many-rowed, arachnoid or white-tomentose; involucre bracts blackish-violet or with black spot, arachnoid pubescent, glabrescent; outer bracts smaller, deltoid, sometimes with herbaceous bent cusps; middle ones larger, ovate-deltoid, usually obtuse; inner ones longest, oblong-lanceolate. Ligulate florets pink. Mature achenes unknown. Flowering July.

Stony and gravelly slopes of mountains.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Baldzhuan. Type in Leningrad.

Section 5. Fibrillosae Nakai in Report. Inst. Sc. Res. Manch. I, 6 (1937) 171.—Perennials. Root collar densely covered with dark brown

fibers of dead leaf petioles. Leaves crowded near stem base. Stems scape-like; with fewer (one to three) leaves. Florets yellow. Achenes smooth or pubescent. Pappus bristles plumose.

Series 12. Subacaules Lipsch. in Addenda XXVIII, 720.—Plants more or less pubescent, almost stemless or scapelike, short, more or less pubescent. Capitula large, up to 5 cm long. Involucral bracts somewhat pubescent. Plant of alpine zone.

30. *S. subacaulis* Lipsch. Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLII, 2 (1933) 160; in Fedde, Repert. XXXIII (1933) 168; Fragm. Monogr. Scorzonera I (1935) 112.—*S. austriaca* var. *intermedia* Rgl. in Bull. Soc. Nat. Mosc. XL, 3 (1867) 170.—*S. austriaca* var. *subacaulis* Rgl. in Tr. Peterb. Bot. Sada, VI, 2 (1880) 323.—**lc.**: Lipsch. op. cit. (1933) 160, Fig. 6–7.

68 Perennial. Root vertical, cylindrical; collar sparsely covered with blackish-brown hairs and sheaths of basal leaves, sheaths more or less broadly scarious along margin. Plants almost “stemless” or scape-like with solitary stems, less often two, (1)3.5–10(18) cm high, arachnoid-pubescent, especially below capitulum, few-leaved (one or two). Basal leaves linear, herbaceous, 2–4 mm wide, spreading or often vertical, usually longer than scape or as long, flat, with three indistinct veins (only midrib more or less prominent, broad), margin weakly scabrous, hyaline; cauline leaves one or two, membranous, scaly, sessile, lanceolate. Capitula solitary, large, broadly cylindrical, 4(4.5)–5(5.5) cm long (including ligulate florets). Base of capitulum often enclosed by bract-like upper cauline leaf, similar in shape to outer involucral bracts. Involucre many-rowed, more or less arachnoid-pubescent, sometimes glabrescent; outer bracts deltoid or ovate, with broadly membranous margin; inner bracts oblong-lanceolate, usually obtuse. Ligulate florets yellow, with dark red parallel veins, pinkish when dry. Achenes slightly curved, 8–10 mm long, 1.5 mm wide, glabrous, striate, smooth; pappus dirty white, its bristles plumose, toothed-scabrous above. Flowering June to July.

Alpine zone, in alpine meadows (Kobresian, etc.) and screes.—*Soviet Central Asia*: Tien Shan. *General distribution*: Dzhungaria-Kashgaria. Described from Kegen District—Labazy Mountains in Sardzhas Valley. Type in Moscow.

Note. It is very probable that *S. subacaulis* Lipsch. represents a polyploid alpine race whose progenitor was *S. austriaca* Willd. If this assumption is confirmed by cytological analysis, it would be more correct to include *S. subacaulis* Lipsch. under series *Austriacae* Lipsch., and eliminate the series *Subacaules* Lipsch.

Series 13. Austriacae Lipsch. in Addenda XXVIII, 720.—Plants glabrous, usually with stem. Involucral bracts glabrous. A plant of steppe, forest-steppe, and forest regions.

31. *S. crispa* M.B. Fl. taur.-cauc. II (1808) 234; DC. Prodr. VII, 1. 120; Ldb. Fl. Ross. II, 2, 794.—*S. austriaca* var. *crispa* (M.B.) Trautv. in Bull. Soc. Nat. Mosc. 39, 2 (1866) 382; Boiss. Fl. or. III, 770.—*S. prescottii* Compere ex DC. Prodr. VII, 1 (1838) 120, nomen.—*S. austriaca* ssp. *crispa* (M.B.) Lipsch. and Krasch. in Lipsch. Fragm. Monogr. Scorzonera I (1935) 118.—**Exs.:** Gallier, Iter. Taur. tertium a. 1900, No. 788.

Perennial. Plant glabrescent; root collar with distinct hairs, often producing series of lateral leaf rosettes. Stems (2)10–20(28) cm high, glabrous, fistular, mostly straight, branched, with two to four capitula, less often simple and with single capitulum; lateral branches arising from axils of scaly cauline leaves. Leaves glaucous, coriaceous, mostly ovate-lanceolate, or oblong-lanceolate, up to 5 cm wide (usually 1.5–3 cm), sometimes falcate, narrowed toward both ends (apex attenuate into hood), with somewhat distinct veins, along margin with cartilaginous and somewhat toothed stripe, undulate-crimped; basal leaves mostly long-petiolate, petioles basally broadened, sometimes floccose on inner side when young, later becoming glabrous; capitula 2.5–3 cm long (at 69 flowering), often covered with scaly bracts. Involucre glabrous; bracts membranous along margin, mostly subobtusate; outer bracts reduced. Ligulate florets yellow, exceeding involucre. Outer achenes somewhat curved, 9–10 mm long, glabrous (sometimes with crown of hairs only at tip), ribbed, sometimes with barely visible tubercles along ribs, usually without them. Flowering April to May. (Plate IV, Fig. 2.)

Limestone hills, slopes, rocks.—*European Part:* Crimea; *Soviet Central Asia:* Balkhash Region (Ulutau Range, hilly terrain of Kazakhstan). Endemic. Described from Crimea. Type in Leningrad.

Note. I have included specimens from the Ulutau Range and the adjacent outlier mountains of Kazakhstan under this species. They also are characterized by glaucescent plants, oval, broadly lanceolate or oblong-lanceolate leaves with an aristate tip, and are identical to the Crimean plants. In the herbarium of the Botanical Institute, Academy of Sciences of the USSR, I had earlier identified the Kazakhstan specimens of this species as *S. austriaca* var. *ulutauensis* Lipsch. (ined.). The abundant fresh material has convinced me that the Crimean and Ulutau specimens are the same species.

32. *S. ruprechtiana* Lipsch. and Krasch. in Lipsch. Fragm. Monogr. Scorzonera I (1935) 121, pro syn.—*S. (austriaca) glabra* Rupr. Flor.

Samojed. cisuralens. (1845) 11, in textu; Kryl. Fl. Zap. Sib. XI, 2984.—*S. austriaca* var. *glabra* Rupr. in Fl. Sev. Urala (1856) 12 and 40.—*S. austriaca* subsp. *glabra* (Rupr.) Lipsch. and Krasch. in Lipsch. op. cit. (1935) 121.—**Ис.:** Lipsch. op. cit. (1935) Plate 44.

Perennial. Root cylindrical, long. Root collar densely hairy. Stem (15)25–50 cm high and 3–6 mm thick, sulcate, hollow, glabrous, often more or less swollen below capitulum. Basal leaves broadly lanceolate to oblong-ovate, narrowed into winged petiole, together 20–30(40) cm long and (0.9) 1.2–3.5(5) cm wide, glabrous, along margins flat; cauline leaves two or three, broadened at base; lower leaves broadly lanceolate; upper leaves small, scaly. Capitula solitary, large, (3)3.5–4(4.5) cm long with florets; involucre 1.2–1.5 cm wide; outer bracts broadly ovate, glabrous; inner bracts oblong. Ligulate florets yellow. Achenes 10–13(15) mm long, somewhat curved, glabrous, smooth, ribbed, with ring of hairs at apex; pappus dirty white. Flowering June to July.

Mountain peaks, slopes and rocks, limestone deposits; gypsum, sandy scarps.—*European Part:* Dvina-Pechora, Volga-Kama, Volga-Don (Zhiguli); *Western Siberia:* Upper Tobol (alpine zone of Urals up to Gubeli Mountains); *Eastern Siberia:* Angara-Sayans, Dauria. Described from northern Urals. Type in Leningrad.

33. ***S. pratorum*** (Krasch.) Stankov in Stank. and Tal. Opred. Vyssh. Rast. (1949) 687.—*S. austriaca* var. *pratorum* Krasch. in Lipsch. Fragm. Monogr. Scorzonera I (1935) 116 and in Fl. Yugo-Vost. VI (1936) 451.—*S. austriaca* ssp. *pratorum* (Krasch.) Lipsch. in sched.—**Ис.:** Lipsch. op. cit. (1935) Plate 42.

70 Perennial. Plant glaucous-green. Stems tall, 25–40(50) cm high, usually dichotomously branched above. Leaves oblong-lanceolate, (1)1.5–2.5(4) cm wide; basal leaves long-petiolate; cauline leaves sessile. Capitula large, (2)2.5 cm (at flowering) and 3–3.5 cm (at fruiting) long; achenes 9–11 mm long, glabrous, smooth, ribbed. Flowering June to July.

Saline meadows, deltas.—*European Part:* Trans-Volga, Lower Volga; *Western Siberia:* Upper Tobol (lower part), Irtysh. Type in Leningrad.

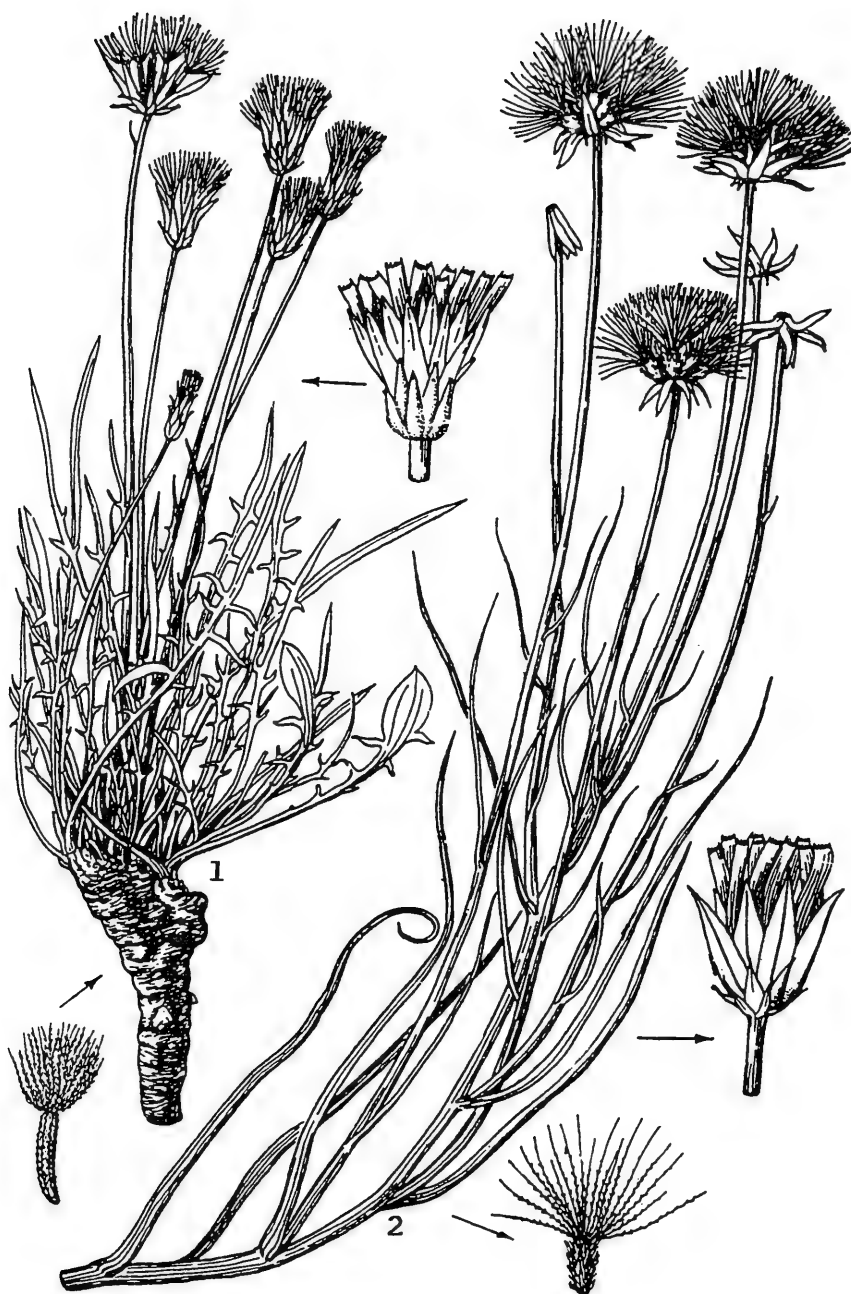
34. ***S. austriaca*** Willd. Sp. pl. III, 3 (1803) 1498; Ldb. Fl. Ross. II, 2, 792; Boiss. Fl. or. III, 770; Schmalh. Fl. II, 143; Lipsch. Fragm. Monogr. Scorzonera I, 107; Krasch. in Fl. Yugo-Vost. VI, 450; Kryl. Fl. Zap. Sib. XI, 2981; Lipsch. in Spisok Rast. Gerb. Fl. SSSR XIII, 130.—*S. humilis* auct. non L.; Jacq. Enum. stirp. Vindob. (1762) 139 and Fl. Austr. I (1773) t. 36; DC. Prodr. VII, 1 (1838) 120 p. p.—*S. graminifolia* auct. non L.: Ldb. Fl. Alt. IV (1833) 161.—**Ис.:** Rchb. Ic. Fl. Germ. XIX, t. 1383; Javorka and Csapody, iconogr. fl. Hungar. No. 3996.—**Exs.:** Fl. exs. Austro-Hung. No. 2243; GRF No. 3996.

Perennial. Whole plant glabrous. Root cylindrical, vertical, dark brown. Root collar covered with numerous dark brown fibers of dead petioles. Stems solitary or a few, (5)10–30 cm high, simple or branched above, sparsely leafy (usually bearing one to three leaves). Leaves always variable in width, linear, linear-lanceolate or broadly lanceolate, flat along margin or more or less undulate-crimped, with several veins; basal leaves narrowed into petioles; cauline leaves one to three, reduced, linear or linear-lanceolate, sessile, with somewhat broadened base. Capitula solitary or two to four, broadly cylindrical, 1.8–2.5 cm long and 0.5–1(1.5) cm wide; involucre glabrous; outer bracts ovate or deltoid-ovate, obtuse or acute; inner lanceolate, obtuse or subobtuse with scarious margin. Ligulate florets yellow, one and one-half to two times as long as involucre. Achenes glabrous, with ring of hairs only below pappus, ribbed, ribs smooth or tuberculate; pappus dirty white, as long as achene. Flowering June to July.

Steppes, stony-gravelly slopes of hills and mountains.—*European Part*: Bessarabia, Middle Dnieper, Black Sea Region, Lower Don, Lower Volga, Trans-Volga, Volga-Kama; *Western Siberia*: Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-Sayans, Lena-Kolyma; *Soviet Central Asia*: Aralo-Caspian, Balkhash region. *General distribution*: Central Europe, Mediterranean, Balkans-Asia Minor, Mongolia. Described from Austria. Type in Berlin.

Note. A highly polymorphic species, varying in shape and width of leaves, growth, size and number of capitula, achene sculpture, etc. On the basis of working through all the material from the USSR, except for a series of geographic (*S. crispa* M.B., *S. ruprechtiana* Lipsch. and Krasch., *S. dianthoides* (Lipsch. and Krasch.) Lipsch., *S. curvata* (Popl.) 72 Lipsch.) and ecological (*S. pratorum* (Krasch.) Stank.) races examined separately, the following key to the varieties of *S. austriaca* s. l. can be proposed with the caution that a large number of transitional forms is found, which do not fit into my proposed classification of this species.

1. Mature achenes densely covered with tubercles along ribs
..... var. **verrucosa** Lipsch. and Krasch.
- + Achenes smooth, without tubercles, or outer achenes slightly
tuberculate below along ribs 2.
2. Capitula two to four on single stem. Peduncles thick, straight
..... var. **triflora** (Fisch.) Lipsch. and Krasch.
- + Capitula solitary 3.
3. Leaves linear, narrow (1–3.5 mm wide)
..... var. **tenuifolia** Lipsch. and Krasch.
- + Leaves broader 4.
4. Leaves glaucous, hard, cartilaginous, 1.5–3 cm wide, with apical



- spinule, highly undulate-crimped along margin.....
 **S. crispa** M.B. (see above).
 + Leaves less hard, curved, broadly lanceolate, less often linear, 0.4–
 1.5 cm wide, partly folded, along margins slightly undulate-crimped
 var. **altaica** Serg.

A detailed description of these varieties can be found in the cited publications of Lipschitz (1935) and Krylov (1949).

A large number of transitional specimens is known from the Transbaikal Region and Yakutia, which cannot be accommodated in the proposed classification scheme of *S. austriaca*. These forms probably are of hybrid origin, involving *S. radiata* Fisch. Additional collections and observations are needed.

35. **S. dianthoides** (Lipsch. and Krasch.) Lipsch. comb. nova.—*S. austriaca* var. *dianthoides* Lipsch. and Krasch. in Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 116.—**!c.**: Lipsch. op. cit. (1935) Table 41.

Perennial. Stems 20–25 cm high, slender, branched above; flowering branches two to four, slender, bent. Leaves linear, 2–4 mm wide, or linear-lanceolate, 7–12 mm wide. Capitula narrowly-cylindrical, 1.5–2 cm long, 3–5 mm wide. Ligulate florets yellow, pinkish when dry. Achenes 7–8 mm long, ribbed, smooth; pappus white, plumose, its bristles barbed above. Flowering May.

Crevices in rocks.—*Western Siberia*: Irtysh (Arkadian Mountains in Semipalatinsk Region). Endemic. Described from the above place. Type in Leningrad.

36. **S. curvata** (Popl.) Lipsch., comb. nova.—*S. austriaca* var. *curvata* Popl. in *Tr. Bot. Muz. Akad. Nauk XV* (1916) 38; Lipsch. 73 *Fragm. Monogr. Scorzonera I* (1935) 114.—*S. humilis angustifolia* Turcz. in *DC. Prodr. VII, 1* (1838) 120 and in *Herb. Acad. Sc. URSS*.—*S. humilis* α . *linearifolia* DC. op. cit. (1838) 120 (excl. syn. *S. angustifolia* Thom. and *S. graminifolia* α . in *Ldb. Fl. Alt. IV* (1833) 161).—*S. austriaca* β . *linearifolia* DC. ex Turcz. in *Bull. Soc. Nat. Mosc. XXI, 3* (1848) 95 (*Fl. baic.-dahur.*).—*S. austriaca* var. *pusilla* Turcz. nomen in herb. and ex Lipsch. op. cit. (1935) 114.—**!c.**: Poplavskaia, op. cit. (1916) page 39, Fig. 1.

Perennial. Small plant, 2–6(10) cm high. Leaves filiform, narrow (1–1.5 mm wide), glaucous, usually helical, longer than stems (together with capitulum). Compared with small size of the whole plant, capitula fairly large, (2)2.5–3 cm long. Involucre glabrous; outer bracts deltoid-lanceolate, acuminate, inner oblong-lanceolate, usually somewhat obtuse; all bracts smaller and narrower than typical *S. austriaca*. Ligulate florets yellow. Flowering May to June.

Steppes.—*Eastern Siberia*: Dauria, Angara-Sayans. *General distribution*: Mongolia. Described from Dauria. Type in Leningrad.

Note. The specimens from the Angara-Sayan District differ from the Daurian ones: they are transitional to *S. austriaca* var. *tenuifolia* Lipsch. and Krasch. According to the practice followed in the Flora of the USSR, I am giving this taxon a binomial name.

Section 6. Pulvinares (Boiss.) Lipsch. in Lipsch. Fragm. Monogr. Scorzonera I (1935) 24.—Subsection *Pulvinares* Boiss. Fl. or. III (1875) 756.—Plants usually small, forming dense tussocks. Stems scapelite, leafless or few-leaved. Leaves linear or lanceolate. Pappus bristles stiff, fragile, often colored, plumose, barbed-scabrous above.

Series 14. Filifoliae Lipsch. in Addenda XXVIII, 720.—Stems scapelite, few. Leaves narrow, filiform-linear. Root collars sparsely covered with sheaths. Achenes glabrous or pubescent.

37. ***S. filifolia*** Boiss. Fl. or. III (1875) 774; Medved. in Tr. Tifl. Bot. Sada, XVIII, 2 (1918) 306; Grossh. in bot. Sborn. Azerb. GNII, I (1932) 54; Grossh. Fl. Kavk. IV (1934) 240; Lipsch. Fragm. Monogr. Scorzonera I (1935) 28, p. max. p.; II (1939) 14–15; Sosnowsky in Zam. po Sist. i Geogr. Rast. Tbil. 13 (1947) 62–64, p. p.; Grossh. Opred. Rast. Kavk. 510; Papava in Fl. Gruzii, VIII, 651; Isaev in Fl. Azerb. VII, 522.—*S. filifolia* var. *vegetior* Trautv. in Tr. Peterb. Bot. Sada, X (1887) 119.—*S. rubriseta* Lipsky in Zap. Kiev. Obshch. Estestv. XI (1891) 52; in Tr. Peterb. Bot. Sada, XIII, 315, p. max. p.; Grossh. op. cit. (1934) 241; Lipsch. op. cit. I (1935) 30; II (1939) 14, p. p.—*S. filifolia* var. *rubriseta* (Lipsky) Grossh. op. cit. (1932) 55.—*S. charadzae* Papava in Fl. Gruzii, VIII (1952) 651 (descr. georg.) and t. 435.—**IC.**, Lipsch. op. cit. (1935) Plate 8.—**Exs.**: Herb. fl. Cauc., No. 396, p. p.

- 74 Perennial. Plant with many-headed rhizome, forming dense tussocks. Root collar covered with sheaths; on inner side covered with woolly growth. Scapes ascending, 7.5–10(25) cm long (including capitula), slender, sulcate, slightly pubescent (glabrescent), with one or three or four capitula, and a few (one to three) scaly leaves; almost all leaves basal, numerous, filiform-linear, rather narrow, 0.5–1 mm wide, weakly pubescent, or almost glabrous. Capitula turbinate, 1.1–1.6 cm long; involucre weakly pubescent; outer involucral bracts small, lanceolate; inner ones lanceolate, oblong, several times as long as outer; all bracts with narrow red stripe along margin. Ligulate florets yellow, exceeding involucre by one-third length. Achenes glabrous, narrowly cylindrical, with thin ribs; pappus dirty white or reddish-brown; pappus bristles stiff, fragile, plumose, barbed-scabrous above. Flowering June to August.

Stony and limestone slopes.—*Caucasus*: Dagestan, Eastern Transcaucasia. Endemic. described from Dagestan. Type in Leningrad.

Note. The varieties being recognized are: var. *incanescens* Sosn. op. cit. (1947) 63, distinguished by tomentose-lanate involucre bracts, peduncles, and leaves; var. *vegetior* Trautv. (= *S. rubriseta* Lipsky, ex parte)—up to 25 cm high, often with branched stems and three or four capitula, pappus usually reddish-brown. I did not see the original specimens from which *S. charadzae* Papava was described (they are preserved in Tbilisi). The species diagnosis is given in the Georgian language and is not accessible to me. Judging from the figure of *S. charadzae*, it represents, in my opinion a large variety of *S. filifolia* and does not deserve to be treated as an independent species. *S. filifolia* is a highly variable species in stem height, nature of branching, leaf width, pappus color, etc.

38. **S. lipskyi** Lipsch. Fragm. Monogr. Scorzonera II (1939) 15.—*S. filifolia* auct. non Boiss.; Lipsch. op. cit. (1935) 28, p. min. p.—*S. filifolia* var. *lipskyi* (Lipsch.) Sosn. in Zam. po Sist. i Geogr. Rast. Tbil. 13 (1947) 63; Grossh. Opred. Rast. Kavk. 510.

Perennial. Very similar to *S. filifolia* Boiss. Stem scapellike, up to 25 cm high, sparsely leafy (cauline leaves one to three); leaves linear-lanceolate, very narrow (up to 1 mm wide). Capitula turbinate, 1.2–1.5 cm long, pubescent; pappus usually reddish-brown. Flowering June to July.

Stony and limestone slopes.—*Caucasus*: Dagestan. Endemic.

Note. Contrary to the opinions of Sosnowsky and Grossheim, for the present I maintain the separate status of this species, which is quite close to *S. filifolia* Boiss., but differs from the latter and other members of section *Pulvinare*s by the presence of pubescence over the entire length of the achene. Although both species were described from the same area (Dagestan), only careful observations of both taxa in their native habitats, on more extensive material than that in my hands, will make it possible to resolve finally the "enigma" concerning the separateness of these close species.

39. **S. seidlitzii** Boiss. Fl. or. III (1875) 775; Seidlitz in Tr. Bot. Sada, Yur'ev Univ. IV (1903) 66; Medved. in Tr. Tifl. Bot. Sada, XVIII, 2 (1918) 306; Grossh. in Bot. Sborn. Azerb. GNII, I (1932) 54; Grossh. Fl. Kavk. IV (1934) 240; Lipsch. Fragm. Monogr. Scorzonera I (1935) 26; Grossh. Opred. Rast. Kavk. 510; Papava in Fl. Gruzii, VIII, 648; Juz. in Spisok Rast. Gerb. Fl. SSSR XIV, 77; Dmitrieva, Opred. Rast. Adzhar. (1960) 287.—**lc.**: Lipsch. op. cit. (1935) Plates 6, 7; Dmitrieva, op. cit. (1960) Plate 34.—**Exs.**: GRF No. 4100.

Perennial. Rhizome vertical, with a few caudices, forming tussocks. Root collar densely covered with lanate sheaths of basal leaves. Basal leaves linear, flat or grooved, 1.5–2.5 mm wide, slightly attenuate toward

apex, densely villous, sinuate, hairs divergent, white, becoming yellow in herbarium. Scapes ascending from base (4)8–18(20) cm long (including capitula), with single capitulum (less often bifurcated in lower part and then with one or two branches), sulcate, pubescence similar to that of leaves, but hairs usually longer. Capitula turbinate, 1.3–2(2.4) cm long, including ligulate florets; involucre woolly-pubescent; outer bracts particularly densely hairy, foliaceous with uncinat apices; inner bracts blackish-brown, with carinate midrib, somewhat coriaceous, linear-lanceolate, two times as long as outer ones. Ligulate florets lemon-yellow, pinkish when dry, one and one-half times as long as outer involucral bracts. Achenes glabrous, 5–6 mm long, slightly curved, cylindrical, reddish-brown when mature, with smooth longitudinal ribs; pappus dirty yellow or often reddish-brown, as long as achene, its bristles stiff, fragile, plumose, barbed-scabrous above. Flowering June to August. (Plate V, Fig. 1)

Subalpine meadows, stony gravelly slopes.—*Caucasus*: Eastern Transcaucasia, Southern Transcaucasia. *General distribution*: Armenia and Kurdistan. Described from Alagyoz. Type in Geneva.

Note. It differs from the related species *S. filifolia* Boiss. by having wider leaves, longer, flexuous, divergent hairs scattered over the whole plant, a woolly pubescent involucre, and longer involucral bracts.

Series 15. Rigidae Lipsch. in Addenda XXVIII, 720.—Stems scapelite, taller, numerous, slender, and erect. Root collar densely covered with rigid sheaths. Leaves narrow, linear.

40. ***S. rigida*** Auch. ex DC. Prodr. VII, 1 (1838) 123; Boiss. Fl. or. III, 774; Post, Fl. Syr., Palest. a. Syn. (1896) 494; Grossh. in Bot. Sborn. Azerb. GNII, I (1932) 54; Grossh. Fl. Kavk. IV (1934) 240; Lipsch. Fragm. Monogr. Scorzonera I (1935) 30; Lipsch. in Spisok Rast. Gerb. SSSR, XIV, 129; Isaev in Fl. Azerb. VIII, 522.—**lc.**: Lipsch. op. cit. (1935) Plates 9, 10; Figs. 1, 2.—**Exs.**: GRF No. 4200.

76 Perennial. Plant with vertical cylindrical rhizome, branched at apex, producing several caudices crowded together; collar of caudices very densely covered with hard leaf sheaths, lanate on inner side. Stems (20)30–40 cm high, numerous, slender, hard, erect, spreading, simple or dichotomously branched, glaucescent, sericeous; later almost glabrous, weakly leafy, much longer than basal leaves. Leaves narrow, filiform-linear, glaucescent-green, flat or incurved, flexuous, pubescent; basal leaves broadened at base into stramineous, glossy sheaths, lanate on inner side; cauline leaves few, reduced, filiform, sessile, at base slightly broadened. Capitula small, 1–1.5 cm long, turbinate, solitary, terminal on stem and branches. Involucre pubescent, bracts weakly carinate, slightly membranous along margin; outer bracts very small, deltoid, acuminate;

inner bracts linear-lanceolate, subobtuse, three to four times as long as outer. Ligulate florets lemon-yellow, longer than involucre by one-third. Achenes 6–8 mm long, glabrous, with obtuse ribs; pappus dirty white, its bristles fragile, plumose, barbed-scabrous above. Flowering July to August.

Stony mountain slopes.—*Caucasus*: Southern Transcaucasia. *General distribution*: Armenia and Kurdistan. Described from West Asia. Type in Geneva, isotype in Leningrad.

Series 16. Koslovskyanae Lipsch. in Addenda XXVIII, 720.—Stems scapelite, leafy. Leaves lanceolate. Pappus hairs reddish-brown.

41. *S. koslovskyi* Sosn. in Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 42 (descript. lat.); Grossh. *Fl. Kavk.* IV (1934) 241 (descript. ross.).—*S. debilis* Sosn. in *Tr. Tbil. Bot. Inst.* II (1938) 222; Grossh. *Opred. Rast. Kavk.* 510; Papava in *Fl. Gruzii* VIII, 648.—*lc.*: Lipsch. op. cit. (1935) Plate 15.

77 Perennial. Plant with thick, vertical, dark brown rhizome, with a few caudices and indurescent remnants of stem bases and basal leaves in upper part. Stems solitary or up to five, 17–20 cm high, slightly bent, usually dichotomously branched above, and then with two capitula, distinctly angular, sulcate, more or less leafy, white tomentose, especially in lower part, glabrous or with scattered hairs above. Leaves hard, lanceolate, more or less pubescent or almost glabrous, with three to five veins; basal leaves lanceolate, 4–7 mm wide and 12–15 cm long, narrowed into sulcate, tomentose petiole; acuminate, with callous cusp; cauline leaves up to 10, lanceolate, reduced, lowermost narrowed into short petiole, higher ones almost sessile; all leaves slightly falcate. Capitula solitary terminal on stems or dichotomous, flexuous, axillary branches, cylindrical or turbinate, 1.8–2 cm (at flowering), and up to 2.5 cm long (at fruiting). Involucre pubescent, involucre bracts often reddish, narrowly membranous along margin; outer bracts small, lanceolate, acuminate, often with deflexed cusps; inner bracts oblong-lanceolate, deltoid, two to two and one-half times as long as outer ones. Ligulate florets yellow, with reddish veins when dry, longer than involucre. Achenes narrowly cylindrical; 7–8 mm long, stramineous, glabrous, with obtuse longitudinal ribs; pappus reddish-brown, slightly longer than achenes; its bristles fragile, plumose, barbed-scabrous above. Flowering July to August.

Stony-gravelly substrates.—*Caucasus*: Eastern Transcaucasia (Akhalkalaki Plateau, Tetrob Range). Endemic. Described from the above place. Type in Moscow; isotype in Tbilisi.

Note. On the basis of the leafy stem and the pubescence, this species can be formally included under section *Tomentosae* (Boiss). Lipsch. However, the combination of other characters (nature of the achene, pappus, involucre, and general appearance) compels me to include *S. koslovskiyi* Sosn. in section *Pulvinares*, to the members of which, in my opinion, it is more closely related. It is a relict endemic plant of the Akhalakalaki Region of the Georgian SSR, where it is found scattered as isolated plants.

Section 7. *Scorzonera*.—*Radiatae* Nakai in Report. Inst. Sc. Res. Manch. I, 6 (1937) 169.—Root perennial [sic; many-headed], with scales and not hairs near collar. Leaves basal and cauline. Stems one-headed. Outer involucral bracts reduced or all almost equal. Achenes smooth. Pappus bristles plumose.

42. ***S. radiata*** Fisch. in Ldb. Fl. Alt. IV (1833) 160; DC. Prodr. VIII, 1, 122; Ldb. Fl. Ross. II, 2, 793; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 96 (Fl. baic.-dahur.); Kryl. Fl. Alt. 3, 733; Kom. and Alis. Opred. Rast. Dalnevost. Kr. II, 1092; Lipsch. Fragm. Monogr. Scorzonera I (1935) 124; Kryl. Fl. Zap. Sib. XI, 2984; Lipsch. in Spisok Rast. Gerb. Fl. SSSR, XIII, 131.—*S. radians* Fisch. ex Bess. in Flora XVII (1834) 1 Beibl. 18.—**Exs.:** GRF Nos. 1225, 3999.

Perennial. Root cylindrical, vertical or ascending, one- or many-headed, in latter case with rosette of basal leaves and a few (two to six) simple stems, each terminating in capitulum. Root collar covered with brown membranous sheaths (or their remnants), never fibrous. Stems (3)5–40(50) cm high, straight, weakly sulcate, more or less arachnoid-tomentose, sometimes floccose-pubescent, especially at base and apex, often almost glabrous in adult specimens, with a few (one to three) leaves. Basal leaves linear or linear-lanceolate; (3.5)5–30 cm long and 3–15(20) mm wide, acuminate, flat, with three to five veins, narrowed toward base into petiole, glabrous or slightly arachnoid-pubescent; cauline leaves (one to three) reduced, (1.5)3–8(12) cm long, sessile, linear, or lanceolate; uppermost
78 leaves often scaly. Capitulum large, solitary, 2.5–3.5(4) cm long (including ligulate florets). Involucre glabrous or slightly arachnoid-pubescent, imbricate; outer bracts ovate-lanceolate, smaller; inner bracts linear-oblong, longer; all bracts slightly membranous along margins, obtuse and with red spot at apex. Ligulate florets light yellow, two to two and one-half times as long as involucre. Achenes 10–12 mm long, glabrous, smooth, ribbed; pappus dirty white; its bristles plumose, five of them longer and barbed above. Flowering May to August (Plate V, Fig. 2).

Alpine and forest zones of mountains, less often in the plains. Stony-gavelly and moss-lichen tundras, alpine and forest meadows, meadow-covered slopes, edges of coniferous forests.—*Western Siberia*: Irtysh (eastern part), Altai; *Eastern Siberia*: Yenisei, Lena-Kolyma, Angara-Sayans, Dauria; *Far East*: Anadyr, Okhotsk, Zeya-Bureya, Uda area, Ussuri, Sakhalin. *General distribution*: Mongolia, China. Described from Altai. Type in Leningrad.

Note. Known from the Okhotsk Region is var. *subacaulis* Lipsch. and Krasch. (Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 125)—a dwarf plant, almost stemless, 1–2 cm high, stems three, densely tomentose; leaves 1–3 mm wide, slightly spreading, weakly uncinatate at tips, distinctly longer than stems. From the alpine zone of the Sikhote Alin Range (Far East) is a plant in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR labeled var. *alpina* Soczara—a shorter plant (10–15 cm high), with narrow leaves (0.4–0.8 cm wide).

43. **S. humilis** L. Sp. pl. (1753) 790; Ldb. Fl. Ross. II, 2, 793; Schmalh. Fl. II, 143; Syreistsch. Illyustr. Fl. Mosk. Gub. III, 327; Hegi, Ill. Fl. VI, 2, 1057. —*S. nervosa* Gilib. Fl. Lithuan. III (1781) 230, non Trev.; Pers. Synops. II (1807) 360.—*S. plantaginea* Schleich. ex Gaud. Fl. helv. V (1829) 20; DC. Prodr. VII, 1, 119.— **Ic.**: Rchb. Icon. Fl. Germ. XIX, t. 1383; Syreistsch. op. cit. 327; Hegi, op. cit. t. 276, fig. 4, 4a, fig. 741, g–k; 742–744.— **Exs.**: Herb. Fl. Ingr. No. 356; Herb. Fl. Reipubl. Sov. Ucr. (1925) No. 100; Eesti Taimed. Tartu Ülikooli Bot. muus. No. 137.

Perennial. Plant lanate, glabrescent. Root cylindrical; root collar covered with membranous scales. Stems solitary or three, (5)15–25(50) cm high, hollow, sulcate, simple or less often branched at apex, with a few (one to three) cauline leaves. Basal leaves long-petiolate, variable in shape and width; oblong-ovate or elliptical, less often lanceolate, with quite prominent veins, acuminate, entire; cauline leaves (one to three) sessile, lanceolate, or lanceolate-linear. Capitula large, 3.5–4(5) cm long (including ligules); peduncles usually lanate below capitulum. Involucre pubescent; outer bracts ovate-deltoid; inner ones longer than outer, lanceolate or oblong-lanceolate, obtuse and often with a red spot at apex. 79 Ligulate florets light yellow, almost two times as long as involucre. Achenes 7–11 mm long, smooth, ribbed; pappus dirty-white, its bristles weakly plumose, longer ones barbed above. Flowering May to June.

Meadows; among shrubs.—*European Part*: Baltic Region, Ladoga-Ilmen, Upper Dnieper, Upper Volga (southern part), Volga-Don, ?Middle Dnieper. *General distribution*: Scandinavia, Central Europe, Atlantic Europe. Described from Europe. Type in London.

Section 8. Parviflorae Lipsch. in Lipsch. Fragm. Monogr. Scorzonera II (1959) 112, pro subsect.—Plant of saline habitats. Leaves green or glaucous, more or less fleshy; stems without distinct virgate branches. Capitula small, with small flowers; ligulate florets slightly exserted from involucre; achenes glabrous, ribbed, smooth; pappus snow-white, pappus bristles plumose.

Series 17. Parviflorae Lipsch. in Addenda XXVIII, 720.—Root collar not thickened. Stems simple, with one to three scaly leaves and one (less often two) terminal capitulum.

44. **S. parviflora** Jacq. Fl. Austr. IV (1776) 3; Willd. Sp. pl. III, 3, 1500; Ldb. Fl. alt. IV, 161; DC. Prodr. VII, 1, 121; Ldb. Fl. Ross. II, 2, 795; Boiss. Fl. or. III, 770; Maxim. in Bull. Acad. Sc. Pétersb. XXXII, 4, (1888) 491; Schmalh. Fl. II, 143; Kryl. Fl. Alt. III, 734; Hegi, Ill. Fl. VI, 2, 1060; Grossh. Fl. Kavk. IV (1934) 242; Lipsch. Fragm. Monogr. Scorzonera II, 136; Kryl. Fl. Zap. Sib. XI, 2989; Lipsch. in Spisok Rast. Gerb. Fl. SSSR, XIII, 131; Isaev in Fl. Azerb. VIII, 523; Lipsch. in Fl. Turkm. VII, 307; Kovalevskaja in Fl. Uzb. VI, 438.—*S. caricifolia* Pall. Reise III (1776) 539 and Anh. 767; Willd. Sp. pl. III, 3, 1500; Claus in Göbel, Reise II, 184.—*S. halophila* Fisch. and Mey. in DC. Prodr. VII, 1 (1838) 122; Boiss. and Buhse in Nouv. Mém. Soc. Nat. Mosc. XII, 139.—*S. schanginiana* Fisch. ex Lipsch. Fragm. Monogr. Scorzonera II (1939) 137, nomen.—**lc.**: Jacq. op. cit. t. 305; Pall. Reise III, 2 (1776) t. II, fig. I; Pall. Putesh. III, 2 (1778) Plate I, i, fig. 3; Hegi, op. cit. fig. 745.—**Exs.**: Lung and Szovits, Herb. ruth. cent. II, No. 139; GRF No. 3998.

Perennial or biennial. Plant wholly glabrous; root branched, many-headed, often producing rosette of radical leaves and one or several stems; root collar bare or covered with scales. Stems (10)15–60 cm long, erect or ascending at base, usually hollow, simple, with single capitulum or less often weakly branched, and then with two or three capitula, sparsely leafy, with one to three scaly leaves. Leaves fleshy, slightly curved, with five to seven veins; basal leaves lanceolate or less often elliptical-lanceolate, 7–20 cm long, 5–15 mm wide, acuminate, narrowed at base into petiole broadened at very base into sheath; cauline leaves small, linear-lanceolate. Capitula solitary, less often two or three, rather small, 13–20 mm long and 3–7 mm wide, broadened at fruiting. Involucre glabrous; outer bracts ovate-deltoid, acuminate; inner ones oblong-lanceolate, subobtusate, sometimes with blackish apical spot; all bracts narrow and scarious along margin. Ligulate florets yellow-waxy, very slightly longer than involucre. Achenes 7–9 mm long, glabrous, ribbed, ribs smooth; pappus snow-white, two times as long as achenes, plumose; five of its bristles longer, barbed above. Flowering May to July.

Solonchaks, saline meadows, seaside meadows, saline marshes.—*European Part*: Volga-Kama (southern part), Middle Dnieper, Volga-Don, Trans-Volga, ?Upper Dniester, Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga; *Caucasus*: Ciscaucasia, Eastern and Southern Transcaucasia; *Western Siberia*: Upper Tobol, Irtysh; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region, ?Kyzyl-Kum, Kara-Kum, mountainous Turkmenia, Amu-Darya, Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: central Europe, eastern Mediterranean (Cyprus), Armenia and Kurdistan, Iran, Dzhungaria-Kashgaria, Mongolia. Described from Austria. Type in Vienna.

Note. *S. carcifolia* is described from specimens collected from the Naryn sands and in the vicinity of Iletskaya Zashchita. Type in Leningrad. *S. halophila* is described on the basis of specimens from Iran. Type preserved there.

Series 18. Mongolicae Lipsch. in Addenda XXVIII, 720.—Root collar thickened from numerous remnants of indurescent sheaths of basal leaves. Stems branched, leafy, with several (up to six) capitula.

45. *S. mongolica* Maxim. in Bull. Acad. Sc. Pétersb. XXXII, 4 (1888) 492; Lipsch. Fragm. Monogr. Scorzonera II (1939) 132.—*S. mongolica* var. *putjatae* Winkl. in Tr. Peterb. Bot. Sada, XIV (1898) 128.—? *S. fengtiensis* Nakai in Report. Inst. Sc. Res. Manch. I, 6 (1937) 167.—**Ic.**: Lipsch. op. cit. (1939) Plate 21.

Perennial. Glaucous, glabrous plant. Root vertical, cylindrical; root collar sometimes two- or three-headed, covered with brown or stramineous indurescent sheaths of basal leaves. Stems more or less numerous, (2.5) 6–20(40) cm high, branched above, straight, ascending at base or sometimes prostrate, glabrous, sulcate, leafy. Leaves fleshy, glaucous, rugose in herbarium, mostly falcate, with three to five indistinct veins; basal leaves lanceolate or linear-lanceolate, acuminate (cusp cartilaginous), narrowed into petiole broadened at base into sheath, floccose within; cauline leaves sessile, reduced in upper part of stem, linear-lanceolate, alternate or less often opposite; uppermost leaves scaly. Capitula terminal on stem and flowering shoots, two to six, narrowly-cylindrical, 1.8–2.8 cm long (including ligulate florets), up to 3.5 cm long at fruiting, 3–7 mm wide. 12–15-flowered, ellipsoidal in bud. Involucre glabrous or slightly pubescent, of 10–12 bracts; outermost bracts similar to upper cauline leaves with more or less wide scarious margin; outer bracts ovate; inner ones linear-oblong, somewhat acuminate. Ligulate florets
81 yellow, pinkish on drying, less often white. Achenes 7 mm long, ribbed, angular, slightly hairy at apex, rest glabrous; pappus snow-white, three to four times as long as achene, its bristles plumose, barbed-scabrous only in upper part. Flowering July to August.

Saline meadows, solanchaks, saline sands, loess with salty coating.—*Soviet Central Asia*: Balkhash Region (Ili River Basin). *General distribution*: Dzhungaria-Kashgaria, Mongolia, China. Described from Mongolia. Type in Leningrad.

Note. A highly variable species, representing the Mongolian element in the flora of the USSR. I have not seen the type of *S. fengtiensis* Nakai, a species described from northeastern China, but on the basis of the description, I have included it, with a question mark, among the synonyms of *S. mongolica* Maxim.

Section 9. Turkestanicae Lipsch. in Addenda XXVIII, 720.—Stems erect, usually highly branched, leafy. Leaves linear or broadly lanceolate. Capitula usually in racemes, many-flowered or less often few-flowered. Involucre many-rowed. Ligulate florets yellow or orange. Achenes glabrous, cylindrical, ribbed, smooth. Pappus dirty white, wholly deciduous, its bristles plumose, 5–10 of them longer, barbed above.

Series 19. Franchetianae Lipsch. in Addenda XXVIII, 721.—Basal and cauline leaves wide, ovate-elliptical or broadly lanceolate.

46. ***S. franchetii*** Lipsch. in Byull. Mosk. Obshch. Isp. Pr. Otd. Biol. XLII, 2 (1933) 154; Lipsch. Fragm. Monogr Scorzonera II (1939) 150.—*S. racemosa* auct. non Franch.: Lipsch. Sist. Zam. ob Aziat. Skorts. (1932) 4, p. min. p.; Pavl. in Tr. po Prikl. Bot. Ser. I, 2 (1937) 288, p. p.—*S. macrophylla* B. Fedtsch. ex Pavl. op. cit. (1937) 289, non Fisch. and Mey.—**Ic.**: Lipsch. op. cit. (1939) Plate 26.

Perennial. Root cylindrical, vertical; root collar slightly covered with indurescent brown sheaths of basal leaves. Stems solitary or several, 40–70 cm high, erect, glabrous or sparsely pubescent, sulcate, leafy, branched above, branches 3–10(20) cm long, each terminating in capitulum. Basal and lower cauline leaves long-petiolate, hard, ovate-elliptical to broadly lanceolate, (13.5)20–30(35) cm long (including petioles) and (1.5)2–3(8) cm wide, acuminate, along margin flat or slightly undulate, serrulate under hand lens; venation almost pinnate, midrib usually wider, prominent, usually broadened at junction with petiole, carinate beneath, lateral veins not prominent; middle cauline leaves linear-lanceolate or lanceolate, (6.5)10–15 cm long and 0.5–2 cm wide; upper leaves reduced, 1.5–4.5 cm long. Capitula (3)7–15 on single stem, broadly cylindrical, 2.5–3.5 cm long (including ligulate florets), terminal on branches. Involucral bracts many-rowed, rigid, pubescent, glabrescent; outer bracts small, deltoid; middle bracts ovate; inner bracts lanceolate, sometimes with somewhat carinate midrib, obtuse, scarious along margin. Ligulate florets yellow, sometimes slightly pinkish when dry. Achenes 0.7–1.2 cm long,

cylindrical, glabrous, smooth, ribbed; pappus dirty-white, wholly deciduous, pappus bristles soft, plumose, five of them longer, plumose at base, barbed, scabrous above. Flowering July to August.

Meadow-covered slopes, sometimes as weed in crop fields.—*Soviet Central Asia*: Syr-Darya (Karatau). Endemic. Described from Syr-Darya Karatau. Type in Moscow.

Series 20. Pauciflorae Lipsch. in Addenda XXVIII, 721.—Capitula narrowly cylindrical, few-flowered. Involucral bracts 12–15.

47. *S. turkestanica* Franch. in Ann. Sc. Nat., sér. VI, Bot. XVI (1883) 333; Lipsch. Sist. Zam. ob Aziat. Skorts. (1932) 3, 4–6; Lipsch. Fragm. Monogr. Scorzonera II (1939) 142.—*S. nuristanica* Kitam. in Acta Phytotax. et Geobot. XVII (1957) 39 and Fl. Afghan. (1960) 443; Koalevskaja in Fl. Uzb. VI, 439 (excl. syn. *S. racemosa* Franch.).—**lc.**: Lipsch. op. cit. (1932) 25, fig. 1; 27, fig. 3; op. cit. (1939) Plate 22; Kitam. op. cit. (1960) fig. 103.

Perennial. Root vertical, slender; root collar sparsely covered with brown or yellow leaf sheaths. Stems 30–80 cm high, solitary or several, erect, somewhat sulcate, weakly pubescent or almost glabrous, leafy. Leaves sparsely pubescent or almost glabrous; basal and lower cauline leaves linear or linear-lanceolate, (2)3–9(12) mm wide, with three to five veins and distinct, whitish midrib sometimes keeled; leaves at base narrowed into long sulcate petiole; middle cauline leaves sessile, slightly amplexicaul, linear, flat, acuminate, gradually reduced upward. Capitula in racemes almost from middle of stem, narrowly cylindrical, 2–3.2 cm long and 0.4–0.6 cm wide, remote, solitary (less often in twos and threes) on short peduncles (longer in many specimens). Capitula 6–8(12)-flowered, ellipsoidal or cylindrical in bud; involucre puberulent, glabrescent, bracts 12–15, unequal; outer bracts deltoid, acuminate, with indistinct midrib; middle bracts ovate; inner ones linear-lanceolate, two to three times as long as outer. Ligulate florets yellow. Achenes 10–13(20) mm long, glabrous, smooth, ribbed; pappus dirty-white, its bristles plumose, 10 of them longer, barbed above. Flowering July to August.

83 Turfy slopes, meadows, herb steppe, forest glades, grassy parts of juniper forests.—*Soviet Central Asia*: Syr-Darya, Tien Shan, Pamiro-Alai (northern part). Endemic. Described from western Tien Shan. Type in Paris; isotype in Leningrad.

Note. I did not see the type of *S. nuristanica* Kitam. (a species described from Nuristan; the type is preserved in the herbarium of Kyoto University). However, the figure of *S. nuristanica* Kitam. leaves no doubt about its identity with *S. turkestanica* Franch. Therefore, I include it among

the synonyms of the latter. *S. turkestanica* Franch. evidently remained unknown to Kitamura, the author of the species, as he mistakenly compares his *S. nuristanica* with *S. purpurea*.

Series 21. Racemosae Lipsch. in Addenda XXVIII, 721.—Capitula broadly cylindrical, many-flowered. Involucral bracts 20–32.

48. *S. iliensis* Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 1 (1933) 178; Kovalevskaja in Fl. Uzb. VI, 439.—*S. racemosa* auct. non Fisch.: Lipsch. Sist. Zam. ob Aziat. Skorts. (1932) 3, 4, p. max. p.; Pavl. in Tr. Prikl. Bot. Ser. I, 2 (1937) 288, p. p.; Lipsch. Fragm. Monogr. Scorzonera II (1939) 143.—*Id.*: Lipsch. op. cit. (1939) Plate 23.

Perennial. Root vertical. Stem (25)35–70(90) cm high, solitary or several, erect, distinctly sulcate, glabrous, or less often somewhat floccose, glabrescent, more or less branched or very rarely simple. Basal leaves linear, (2)4–10 mm wide, narrowed into long, sulcate petioles, base broadened into membranous sheaths loosely covering root collar; leaves hard, flat or folded, scabrous along margin, with three–five(seven) veins; venation parallel, with somewhat prominent veins, midrib usually white, often carinate, broadened toward petiole; cauline leaves narrow-linear, sessile, slightly amplexicaul, arcuately divergent, reduced above. Capitula on peduncles, more or less numerous, less often solitary, forming indistinct corymbose head; peduncles with reduced leaves; capitula globular in bud. Involucre arachnoid-pubescent, many-rowed, glabrescent, bracts rigid, 20–32, slightly membranous along margin; outermost bracts small, deltoid, those in second row ovate-deltoid, inner ones lanceolate, obtuse, with or without prominent carinate midrib. Ligulate florets yellow, strongly exerted from involucre. Achenes up to 15 mm long, glabrous, smooth, ribbed; pappus dirty white, its bristles plumose, 5–10 of them longer, barbed above. Flowering June to August.

Dry stony slopes, meadow slopes, among shrubs, saline meadows on floodplains.—*Soviet Central Asia*: Balkhash Region (Ili River valley), Syrdarya (Karatau), Tien Shan (western), Dzhungaria-Tarbagatai. Endemic. Described from Ili River. Type in Leningrad.

Note. Acquaintance with the photograph of the type of *S. racemosa* Franch.—the species described from Namangan in Fergana (type preserved in Paris)—has shown me that earlier I had wrongly identified it with *S. iliensis* Krasch. The present condition of the type of *S. racemosa* Franch. did not permit me to clarify the taxonomic position of *S. racemosa* Franch. (non Lipsch.) in the classification of the genus. This species remains unclear to me. Kovalevskaja (*Flora of Uzbekistan*, VI (1962) 439) included *S. racemosa* Franch. among the synonyms of *S. turkestanica* Franch.

49. *S. transiliensis* M. Pop. in Lipsch. Fragm. Monogr. Scorzonera II (1939) 148.—*S. purpurea* var. *subincana* Rgl. and Herd. in Bull. Soc. Nat. Mosc. XL, 3 (1867) 170.—*S. racemosa* auct. non Franch.: Lipsch. Sistem. Zam. ob Aziat. Skorts. (1932) 4, p. min. p.—**lc.**: Lipsch. op. cit. (1939) Plates 24 and 25.—**Exs.**: Lipsch. Herb. cum sched. lithogr. a CUNIPMED edit. (1933) No. 200 (sub nom. *S. racemosa* Franch.).

Perennial. Root vertical, producing one to three shoots and sometimes rosettes of basal leaves; root collar sparsely covered with leaf sheaths. Stems 25–75 cm high, indistinctly sulcate, glabrous or weakly floccose, simple or often branched above, branches two or three (five), 3.5–12 cm long, each with single capitulum. Basal and lower cauline leaves simple, linear or less often linear-lanceolate, 0.4–0.8(1) cm wide, acuminate, along margin scabrous and serrulate (hand lens!), puberulent, veins narrow, parallel lamina (especially in basal leaves) narrowed at base into long petiole; upper cauline leaves and those on branches reduced, narrowly linear, subulate. Capitula cylindrical, 3–3.5 cm long, one to three(five). Involucre of rigid bracts, in three to five rows; outer bracts smaller, deltoid-ovate; middle bracts lanceolate; inner ones lanceolate or linear-lanceolate, obtuse; all bracts arachnoid-pubescent, glabrescent. Ligulate florets dark orange, about 1.5 cm long and 2.5 mm wide, five-toothed at tip. Achenes narrowly terete, 1–1.5 cm long, glabrous, slightly ribbed, whitish, reddish when mature; pappus dirty white, wholly deciduous, its bristles plumose, five of them longer, barbed. Flowering July to August.

Meadows on mountain slopes, secondary herb meadows in the Schrenk spruce (*Picea schrenkiana* Fisch. and Mey.) zone, often on clayey slopes.—*Soviet Central Asia*: Tien Shan (Trans-Ili Alatau, Ketmen Mountains, Kungei Alatau). Endemic. Described from Trans-Ili Alatau. Type in Alma Ata.

Note. *S. transiliensis* M. Pop. is a race quite close to *S. iliensis* Krasch., from which it differs at once when flowering by its dark orange ligulate florets, which are very conspicuous. Variation in leaf width is observed, particularly, in herbarium collections from the region of the Sardzhass Valley (eastern Tien Shan), which are distinguished by narrow leaves (1–2 mm wide) and greater xerophily and are being recognized as a separate variety—var. *angustifolia* Lipsch. (op. cit. (1939) 150). This species was erroneously identified by earlier workers (Regel, Herder) as *S. purpurea*, with which it has nothing in common.

85 **Section 10. Foliosae** (Boiss.) Lipsch. comb. nova in Addenda XXVIII, 721.—Subsection *Foliosae* Boiss. Fl. or. III (1875) 756.—Plant pubescent or glabrous. Stems leafy, often tall. Outer achenes more or less tuberculate or scaly-acerate along ribs.

Series 22. Strictae Lipsch. in Addenda XXVIII, 721.

50. *S. gracilis* Lipsch. in Addenda XXVIII, 721.

Perennial. Whole plant grayish, densely fine-tomentose from stellate hairs. Root cylindrical; root collar covered with broadened brown indurescent sheaths of previous year's basal leaves and current year's hyaline, weakly glossy leaf sheaths. Stems 15–20 cm high, erect or slightly ascending, simple or sparsely branched. Leaves narrowly linear, densely pubescent; basal leaves 2–4 mm wide, often folded lengthwise, subulate at apex, almost as long as stem or one-third shorter, base broadened into hyaline, glabrous sheath; cauline leaves reduced, few, sessile, slightly semiamplexicaul; solitary uppermost leaf reduced, often approximate to capitulum, forming bract with attenuate-aristate apex. Capitula solitary or two to five, large, 2.5–3 cm long, 7–8 mm wide (at flowering). Involucre canescent; outer bracts ovate or deltoid-ovate; inner ones oblong-lanceolate; all bracts more or less acuminate, membranous along margin, especially inner ones. Ligulate florets pink, considerably longer than involucre (two times as long). Mature achenes unknown, young achenes ribbed, acerate along ribs; pappus of unequal bristles, bristles plumose, barbed-scabrous above. Flowering May.

Stony slopes.—*Soviet Central Asia*: Pamiro-Alai (Shugnan). Endemic. Described from vicinity of Khorog. Type in Leningrad.

Note. It is easily distinguished from the sister species *S. pubescens* DC. by its white-tomentose pubescence and pink flowers.

51. *S. stricta* Hornem. Hort. Hafn. II (1813) 750; M.B. Fl. taur.-cauc. III (1819) 522; DC. Prodr. VII, 1 (1838) 122, p. p.; Boiss. Fl. or. III, 768, excl. syn.; Schmalh. Fl. II, 142; Krasch. in Fl. Yugo-Vost. VI, 448; Grossh. Opred. Rast. Kavk. 511; Kryl. Fl. Zap. Sib. XI, 2991.—*S. villosa* M.B. op. cit. II (1808) 235, excl. syn.—*S. marschalliana* auct. non C.A.M.: Ldb. Fl. Ross. II, 2 (1845–1846) 795, ex parte.—*S. hispanica angustifolia* auct. Fl. Ross.—*S. marschalliana* auct. plur. fl. Ross. non C.A.M.

Perennial. Plants more or less pubescent, greenish. Root cylindrical, up to 2.5 cm thick; root collar covered with light brown, entire or fibrous remnants of sheaths. Stems solitary, erect, 20–50 cm high, branched, branches 8–20 cm long, erect, flexuous. Leaves long, linear or linear-lanceolate, gradually narrowed toward tip, acuminate-subulate, flat or folded, 2–7 mm wide, with prominent keel beneath; basal leaves with broadened base; cauline leaves semiamplexicaul. Stem leafy throughout, particularly more densely in lower half. Capitula (2)3–10(20), on upright peduncles, cylindrical, 2.5–3(3.5) cm long and 5–7 mm wide (at flowering). Involucre arachnoid-pubescent; outer involucral bracts broadly lanceolate, usually with distinct, somewhat carinate midrib, acuminate; inner bracts oblong, acuminate. Ligulate florets yellow, longer than

involucre. Achenes 10–12 mm long, glabrous, with ring of hairs at tip at articulation of pappus; outer achenes tuberculate along ribs, more or less acerate; pappus dirty white, its bristles plumose, longer of them barbed-scabrous above. Flowering June to July.

Steppes (meadow; sandy; feathergrass-sheep fescue-wormwood; with stands of *Spiraea*; *Festuca*; saline and *Stipa lessingiana*) and meadows.—*European Part*: Crimea, Bessarabia, Black Sea Region, Lower Don, Lower Volga, Trans-Volga, Volga-Don, Volga Kama; *Western Siberia*:. Upper Tobol, Irtysh (western part); *Soviet Central Asia*: Aralo-Caspian (northern part); *Caucasus*: Ciscaucasia, Western Transcaucasia, Dagestan. Described from ? Type in Copenhagen.

52. *S. pubescens* DC. Prodr. VII, 1 (1838) 122; Kryl. Fl. Zap. Sib. XI, 2990.—*S. stricta* auct. non Hornem.: Ldb. Fl. alt. IV (1833) 163; Kryl. Fl. Alt. III (1904) 735.—*S. stricta* auct. fl. turkest. p. max. p.—*S. marschalliana* C.A.M. in Mém. Ac. Pétersb. VI, sér. Sc. nat. IV (1841) 200.

Perennial. Plant grayish from short-branched hairs. Root cylindrical, vertical; root collar covered with brown membranous leaf sheaths. Stems solitary or several, (3.5)7–20(35) cm high, more or less branched, often from base, densely leafy below. Leaves 5–20 cm long, linear, 1–5 mm wide, more or less curved, flat or folded, carinate beneath, margin sometimes undulate; basal leaves broadened into glossy sheath; cauline leaves somewhat broadened at base, semiamplexicaul, uppermost leaves reduced, subulate. Capitula solitary, terminal on stem and branches, 2–2.5 cm long and 3–7 mm wide (at flowering). Involucre pubescent, glabrescent; outer involucral bracts ovate-deltoid, usually with prominent midrib, sometimes slightly carinate; inner bracts broadly lanceolate, scarious along margin, both acuminate. Ligulate florets yellow, sometimes reddish below; outer florets one and one-half times as long as involucre. Achenes terete, (8)10–12(14) mm long, glabrous, outer achenes ribbed above, acutely or obtusely tuberculate: tubercles variable; pappus dirty white, longer than achenes, with crown of hairs at articulation of pappus, plumose, longer bristles barbed-scabrous above. Flowering May to June.

Stony and gravelly steppe slopes of hills and mountains, rocks.—*Western Siberia*: Irtysh, Altai; *Soviet Cenral Asia*: Aralo-Caspian, Balkhash Region, Syr-Darya, Tien Shan, Dzhungaria-Tarbagatai. Endemic. Described from Siberia. Type in Geneva.

87 **Note.** Where the ranges of *S. pubescens* and *S. stricta* meet in western Kazakhstan, intermediates between the two species are found.

Series 23. Hispanicae Lipsch. in Addenda XXVIII, 721.—Leaves ovate-lanceolate or lanceolate.

53. *S. hispanica* L. Sp. pl. (1753) 791; Willd. Sp. pl. III, 3 (1803) 1499, p. p.; DC. Prodr. VII, 1 (1838) 120, p. p.; Ldb. Fl. Ross. II, 2, 794; Boiss. Fl. or. III, 767; Grossh. Fl. Kavk. IV (1934) 241; Grossh. Opred. Rast. Kavk. 511.—*S. taurica* M.B. Fl. taur.-cauc. II (1808) 234; III (1819) 521; DC. Prodr. VII, 1 (1838) 121; Stank. and Tal. Opred. Vyssh. Rast. (1949) 687; Isaev in Fl. Azerb. VIII, 523.—*S. glastifolia* Willd. op. cit. (1803) 1499.—*S. hispanica* β . *glastifolia* (Willd.) Wallroth. Ann. bot. suppl. Fl. gall. (1815) 95.—*S. crispatula* auct. non Boiss.: Stank. in Stank. and Tal. op. cit. (1949) 687.

Perennial. Plant pubescent, glabrescent. Root cylindrical. Stems (25)35–50(75) cm high, erect, usually branched in upper part or from middle; branches erect; stem base covered with more or less numerous, broadened, indurescent, glossy, stramineous or brown sheaths of basal leaves. Leaves crowded in lower third of stem, ovate-lanceolate or oblong, with many veins (midrib often broader, hyaline), pubescent or glabrous, margin flat or slightly undulate, scabrous-toothed; lower leaves long-petiolate; middle leaves oblong-lanceolate, amplexicaul, acuminate; uppermost leaves subulate. Capitula few, terminal on branches, cylindrical, large, 2–2.5(3) cm long (at flowering). Involucre pubescent, glabrescent; outer involucral bracts ovate; inner oblong-lanceolate, all bracts acuminate. Ligulate florets yellow, one and one-half times as long as involucre. Achenes (mainly outer) 10–14 mm long, angular-ribbed, more or less finely rugose-tuberculate along ribs; pappus dirty-white, its bristles plumose, longer of them barbed-scabrous above. Flowering May to June.

Meadows, steppes.—*European Part*: Volga-Middle Dnieper, Volga-Don, Trans-Volga Region, Lower Volga, Black Sea Region, Crimea; *Western Siberia*: Upper Tobol; *Caucasus*: Ciscaucasia, Eastern and Western Transcaucasia, Dagestan; *Soviet Central Asia*: Aralo-Caspian Region (northern part). Type in London.

Note. *S. hispanica* L. was described from cultivated plants. Probably, the name *S. taurica* M.B. is more appropriate for our representatives of this species aggregate. However, following tradition, pending a monographic study of *S. hispanica* s. l., I am tentatively placing this plant under the widely used name *S. hispanica* L.

88 54. *S. inconspicua* Lipsch. ex Pavl. in Byull. Mosk. Obsch. Isp. Prir. Otd. Biol., XLII, 2 (1933) 139; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 92; Kryl. Fl. Zap. Sib. XI, 2992; Kovalevskaja in Fl. Uzb. VI, 440.—*S. marschalliana* var. *oblongifolia* Trautv. in Bull. Soc. Nat. Mosc. 39, 2 (1866) 383.—*S. marschalliana* var. *latifolia* Rupr. in Mém. Acad. Sc. Pétersb. VII, ser. XIV, 4 (1869) 58.—*S. taurica* auct. fl. turk., non M.B.—*S. hispanica* auct. fl. turkest. pro max. parte, non L. nec Willd.—*S. macrophylla* Herd. in herb.—**Ис.**: Pavlov in Byull. Mosk.

Obshch. Isp. Prir. Otd. Biol. XLII, 2 (1933) 139.—Exs.: Pavl. and Lipsch. Pl. exs. edit. CUNIPMED (1932) No. 50.

Perennial. Plant weakly pubescent, sometimes glabrescent. Root collar covered with indurescent brown or stramineous sheaths of basal leaves. Stems 10–25(35) cm high, pubescent, mostly branched from base or middle; branches curved, flexuous, terminating in solitary capitula. Basal leaves broadly lanceolate, hard, curved, with many veins, margin cartilaginous, usually undulate and scabrous, pubescent with branched hairs or almost glabrous, narrowed at base into petiole; cauline leaves sessile, semiamplexicaul, narrower than basal leaves, undulate along margin, gradually reduced above. Capitula 2–4(10), long cylindrical, 2–2.5(3) cm long and 0.5–0.8(1) cm wide (at flowering), broader at fruiting, terminal on branches. Involucre pubescent; bracts coriaceous, outer bracts deltoid-ovate, somewhat acuminate; inner bracts oblong-lanceolate, narrowly membranous along margin, more or less acuminate or subobtusate, several times as long as outer. Ligulate florets yellow, one and one-half to two times as long as involucre. Mature achenes terete, 10–15 mm long, glabrous, ribbed, somewhat acerate along ribs, sometimes only in upper part scabrous; pappus dirty white, its bristles plumose, longer of them barbed above; crown of hairs at articulation of pappus with achene. Flowering May to July.

Stony-gravelly slopes.—*Western Siberia*: Irtysh; *Soviet Central Asia*: Syr-Darya, Tien Shan, Pamiro-Alai, Balkhash Region, Dzhungaria-Tarbagatai. Endemic. Described from Syr-Darya Karatau. Type in Moscow; isotype in Leningrad.

Note. The Pamir specimens differ in having dense grayish-pubescent, scapellike, and shorter (7–10 cm high) stems. Evidently, it is a separate race, needing observations in the field and new, more complete collections (var. *incana* Lipsch.).—Collections from Kirgizia (vicinity of Lake Issyk-Kul, Ortotokoi, on mesas V. 1941. O.E. Knorring) differ from the type as follows: plant green, almost glabrous; capitulum smaller; involucre bracts narrower, all lanceolate; inner bracts with distinct veins; mature outer achenes 13 mm long, olive-colored, covered with spinules along entire length. Apparently, it is a separate species, but the available material is insufficient to describe it.—*S. inconspicua* Lipsch. occurs mixed with *S. pubescens* DC. in western Kazakhstan.

55. *S. chantavica* Pavl. in Vestn. Akad. Nauk Kazakh. SSR 8 (1950) 27.—**lc.**: Pavl. op. cit. 28, Fig. 19.

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Perennial. Plant slightly pubescent. Root woody, thickened at apex, many-headed; root collar covered with indurescent remnants of petioles of basal leaves. Stems 25–30 cm high, slender, sulcate, simple or branched. Basal leaves rosulate, obovate-lanceolate, 8–10 cm long, 1.5–2 cm wide,

narrowed into broad-winged petiole, grooved on upper side; leaves broadest in middle, somewhat acuminate, cartilaginous along margin, slightly undulate; cauline leaves reduced, lanceolate, sessile, somewhat amplexicaul. Capitula on long peduncles, cylindrical, 2.5 cm long, 0.6–0.7 cm wide (at flowering). Involucre arachnoid-pubescent, glabrescent; outer bracts broadly ovate or roundish, 5–6.5 mm long, short-acuminate; middle bracts oblong, broadly lanceolate, acuminate, 10–11 mm long; inner bracts oblong-lanceolate, 15–25 mm long, subobtusate, with red stripe along margin and narrowly membranous, with one vein. Ligulate florets yellow, exerted from involucre. Achenes cylindrical, mature achenes (10)12–13 mm long, brown, ribbed, short-scaly-acerate along ribs; pappus dirty white, as long as achene, its bristles plumose, longer of them barbed-scaprous above. Flowering May to June.

Stony rubbly slopes.—*Soviet Central Asia*: Tien Shan (Chu-Ili Mountains). Endemic. Described from Chu-Ili Mountains. Type in Alma-Ata.

Section 11. Polycladae DC. Prodr. VII, 1 (1838) 125; Benth. and Hook. f. Gen. pl. II (1873) 532; O. Hoffm. in Pflanzenfam. IV, 5 (1893) 365; Lipsch. Fragm. Monogr. Scorzonera II (1939) 111.—Capitula few-flowered, comparatively small. Stems highly branched, branches mostly virgate, sparsely leafy.

Series 24. Acanthocladae Lipsch. in Addenda XXVIII, 722.—Semishrubs, spherical in habit, usually with numerous prickly remnants of previous year's branches. Stems with number of partly prickly sterile branches. Cauline leaves small, linear-subulate. Capitula narrowly cylindrical, few-flowered.

56. *S. acanthoclada* Franch. in Ann. Sc. Nat. sér. VI, XVI (1883) 333; Lipsch. Sist. Zam. ob Aziat. Skorts. (1932) 8; Tekutiev in Zhurn. "Sov. Kauchuk" 3 (1933) 37; Vel'tishchev and Vel'tishcheva in Zhurn. "Priroda", 9 (1934) 62; Lipsch. Fragm. Monogr. Scorzonera II (1939) 113; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 94; Lipsch. in Fl. Turkm. VII, 308; Kovalevskaja in Fl. Uzb. VI, 440.—*S. chondrilloides* Rgl. and Schmalh. in Izv. Obshch. Lyubit. Estestv., Antrop. i E'tnogr. XXXIV, 2 (1882) 54 (non *S. chondrilloides* Pourr. ex Willd., 1803).—*Ic.*: Zhurn. "Priroda", 9 (1934) pp. 62–64; Lipsch. op. cit. (1939) plate 17.

Perennial. Plant weakly pubescent, glaucescent semishrub, often spherical in habit. Root cordlike, with several small lateral roots, growing deep into soil, often twisted, producing numerous caudices near root collar, forming turf, covered with dark brown remnants of previous year's leaf

- 90 sheaths. Stems usually numerous, slightly curved, dichotomously branched, successively branched forming slightly spinose branches of second and third order; previous year's (dry) stems usually with numerous lateral spinescent branches. Basal leaves narrowly linear or linear-lanceolate, mostly with three veins, almost as long as stem; cauline leaves reduced, linear-subulate. Capitula narrowly cylindrical, about 1.5–2.5 cm long and 2–8 mm wide, on somewhat long flowering branches (isolated specimens having up to 1,500 capitula!), with three to five flowers. Involucre of few appressed pubescent bracts. Ligulate florets yellow, red on drying. Achenes 10–12 mm long, ribbed, smooth, few in each capitulum; pappus dirty white, as long as achene, pappus bristles plumose to two-thirds, barbed-scabrous above, with ring of hairs at articulation of pappus with achene. Flowering July to August.

Slopes of northern, northwestern, and northeastern exposure within altitudinal limits of 2,200–3,800 m, in alpine and subalpine zones. On clayey slopes, forming part of steppe-type cenoses with a predominance of grasses; on slopes with coarse poor soils, forming groupings with predominance of montane xerophytes.—*Soviet Central Asia*: Pamiro-Alai. *General distribution*: Afghanistan. *S. acanthoclada* Franch. described from Archamaidan. Type in Paris.

Note. *S. chondrilloides* Rgl. and Schmalh. was described from Central Asia (Kekh); the type is preserved in Leningrad.

57. *S. kuhistanica* M. Pop. in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 94.

Similar to preceding species. Branches not spinescent. Stems 20–30 cm high. All leaves linear; basal leaves up to 30 cm long. capitula not large, at flowering 1.2–1.5 cm and at fruiting 2.5 cm long. Achenes 14 mm long, with violet stripes.

On slopes in the glacier region.—*Soviet Central Asia*: Pamiro-Alai (Kugistan). Endemic. Described from Zeravshan (Kugistan). Type in Tashkent.

Note. I did not see the original specimens of this species, which the author himself says is connected by intermediates with *S. acanthoclada* Franch. I think that *S. kuhistanica* M. Pop. should include *S. acanthoclada* var. *gracilis* Tekut., which was characterized by Tekutiev by the following characters: "Plant taller (25–70) cm high); stems fewer (five to eight), less branched, comparatively little curved; leaves glabrous even when young, linear-lanceolate, wider than in the typical form (3–8 mm wide), basal leaves with four to six veins; capitula five- to eight-flowered (less often with 12 flowers)." Distributed in Darvaz and Shugnan. In order to clarify the relationship between the species pair *S. kuhistanica*—*S. acanthoclada*, new observations and collections from the field are needed.

I did not find a single specimen of *S. acanthoclada* without prickly branches in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, which could be identified as *S. kuhistanica*. Kovalevskaja (Fl. Uzb. VI (1962) 440) included *S. kuhistanica* M. Pop. among the synonyms of *S. acanthoclada* Franch. Tentatively, I have left the former in the key as a separate taxon, in order to attract the attention of investigators to this confusing species.

In *Symb. Afgh.* II (1955) 195 and Fig. 135, 137, a new species, *S. polyclada* Rech. f. and Köie, is described from Afghanistan, compared by the authors with *S. tortuosissima* Bouss., and referred to subsection (in my interpretation, section) *Intricatae* Boiss. I did not see either the types of this species (they are preserved in Vienna and Copenhagen) or the other original specimens. Judging from the description and figures, it is quite probable that *S. polyclada* Rech. f. and Köie represents *S. acanthoclada* s. l., more precisely, var. *gracilis* Tekut. (= *S. kuhistanica* M. Pop.). This is all the more probable because *S. acanthoclada* is not cited by Rechinger in his work on Afghanistan.

Series 25. Divaricatae Lipsch. in Addenda XXVIII, 722.—Semishrubs or perennials without numerous prickly remnants of previous year's stems. Stems without sterile branches. Cauline leaves well developed.

58. *S. pseudodivaricata* Lipsch. in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLII, 2 (1933) 158; Kotov in Sov. Bot. 3 (1935) 68, 69; Lipsch. Fragm. Monogr. Scorzonera II (1939) 128.—*S. divaricata* var. *foliata* Maxim. in Bull. Acad. Sc. Pétersb. XXXII, 4 (1888) 494.—*S. divaricata* var. *virgata* Maxim. op. cit. (1888) 495.—*lc.*: Lipsch. op. cit. (1939) Plates 19 and 20.

Perennial. Semishrub with few caudices. Root collar covered with indurulent, entire, or fibrous sheaths of basal leaves. Stems 10–45 cm high, numerous, glabrous, or pubescent, subsequently woody, virgate, branched always from middle or above. Basal leaves up to 17 cm long, broadened at base into brown or stramineous sheaths; cauline leaves alternate, sometimes almost opposite at base of branches, somewhat falcate, narrowly linear, 1–9 cm long and (0.5)2–4.5 mm wide, acuminate, sometimes uncinat; upper cauline leaves reduced to scales. Inflorescence lax corymbose panicle. Capitula usually numerous, narrowly cylindrical, 1.3–2.5 cm long (including ligulate florets), solitary, terminal on branches, 7–12-flowered. Involucral bracts many-rowed, glabrous or pubescent; outer bracts small, triangular, somewhat acuminate; middle bracts ovate, two to three times as long; inner bracts oblong-lanceolate, almost two times as long as middle ones. Achenes 5–10 mm long, terete, sometimes slightly curved, yellow or dark green, glabrous or with ring of hairs below pappus,

ribbed, ribs tuberculate or smooth; pappus white, its bristles plumose, barbed above. Flowering July to August.

- 92 Rocks, stony scree, outcrops of marblelike limestone and quartzites, pebbles.—*Soviet Central Asia*: Tien Shan (central Angiz area). *General distribution*: Dzhungaria-Kashgaria, Mongolia, China. Described from Mongolia (Hangai). Type in Leningrad.

Section 12. Pusillae Lipsch. in Lipsch. *Fragm. Monogr. Scorzonera* II (1939) 59.—More or less spreading perennials with tuberous roots. Leaves twisted at apex. Capitulum narrowly cylindrical, usually numerous (up to 50). Ligulate florets slightly exerted from involucre, yellow, red on drying. Achenes narrow, terete or prismatic, with longitudinal ribs, glabrous, smooth, or less often slightly scabrous.

59. **S. pusilla** Pall. *Reise* II (1773) 329 and Anh. 744; Willd. *Sp. pl.* III, 3, 1501; M.B. *Fl. taur.-cauc.* II, 237; Eichwald, *Pl. nov.* (1831–1833) 2, descr. emend.; Ldb. *Fl. Alt.* IV, 160; DC. *Prodr.* VII, 1, 118; Ldb. *Fl. Ross.* II, 2, 791; Boiss. *Fl. or.* III, 771; Maxim. in *Bull. Acad. Sc. Pétersb.* XXXII, 4 (1888) 492; Paczoski, *Florograf. i Fitogeogr. Issl. Kalmytsk. Step.* (1892) 86; Schmalh. *Fl.* II, 144; Grossh. *Fl. Kavk.* IV (1934) 239; Krasch. in *Fl. Yugo-Vost.* VI, 451; Lipsch. *Fragm. Monogr. Scorzonera* II (1939) 59; Kryl. *Fl. Zap. Sib.* XI, 2986; Isaev in *Fl. Azerb.* VIII, 524; Lipsch. in *Fl. Turkm.* VII, 308; Kovalevskaja in *Fl. Uzb.* VI, 443.—*S. circinnata* Pall. *Reise* III (1776) 677.—*S. astrachanica* DC. *Prodr.* VII, 1 (1838) 118; Paczoski, op. cit. (1892) 87.—*S. scoparia* Claus ex Lipsch. op. cit. (1939) 61, non Boiss. and Kotschy, nomen.—*Dschangiiria desertorum* Less. ex Lipsch. op. cit. (1939) 61, nomen.—*S. popovii* Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 23.—**lc.**: Pall. *Reise* II, 2 (1773) tab. L; Lipsch. op. cit. (1939) Plate 8.

Perennial. Plant (4)10–25(40) cm high, mostly spreading. Roots with single, sometimes many tubers; root collar covered with sheaths, sheaths subsequently fibrous, often pubescent on inner side. Stems flexuous, sulcate, mostly branched, less often simple, pubescent (sometimes floccose) or glabrous, leafy. Leaves alternate, less often opposite or even almost whorled (in groups of three), mostly arcuately bent, glaucous, pubescent, narrowly linear, 1–1.5(2) mm to 3–4.5 mm wide (var. *latifolia* Lipsch.), with three veins, flat or folded, with filiform, uncinat or slightly twisted tip. Capitula narrowly cylindrical, 1–3 cm (including ligulate florets), at fruiting 1.7–4.5 cm long, on somewhat spreading peduncles, 5–20 (up to 50!) per plant. Involucre of few bracts, arachnoid-pubescent; outer bracts reduced, ovate; middle ones oblong, obtuse; inner ones oblong-lanceolate or linear-lanceolate, scarious along margin, subobtuse. Ligulate florets yellow, pink when dry, one-fourth to one-third longer than involucre.

- 93 Achenes 7–12 mm long, glabrous, with longitudinal ribs; ribs smooth, sometimes some of them spinulose, resulting in scabrous achene; pappus white, two to two and one-half times as long as achene, pappus bristles spreading, plumose up to two-thirds length, barbed-scabrous above. Flowering (March) April to May (June).

Saline lands, stony slopes, sands, sandy steppes.—*European Part*: Lower Volga; *Western Siberia*: Upper Tobol (southern part), Irtysh; *Caucasus*: Southern Transcaucasia (Nakhichevan); *Soviet Central Asia*: Kara-Kum, Kyzyl-Kum, Amu-Darya, Aralo-Caspian, Syr-Darya, Pamiro-Alai, Tien Shan, Dzhungaria-Tarbagatai. *General distribution*: Iran, Dzhungaria-Kashgaria, Mongolia. Described from the Caspian desert. Type in London.

Note. As reported by several travelers and collectors, the tubers of this species are edible.

In a series of specimens, especially from Mangyshlak, Kyzyl-Kum, and eastern Kazakhstan the achenes are swollen, pyriform in the lower part. This is explained by the presence of a parasite inside the achene.

Section 13. Papposae Lipsch. and Krasch. in Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 45.—Plants mostly with thick, tuberous roots. Stems branched from middle or base. Basal leaves petiolate, broadly ovate or oblong-lanceolate. Stems prostrate, scapellike, leafy only at base and lower third, or tall and densely leafy. Capitula narrowly or broadly cylindrical. Involucral bracts coriaceous; outer bracts ovate-deltoid, obtuse; inner ones oblong-lanceolate. Achenes flattened-cylindrical, mostly white, ribbed, slightly curved, with transverse rows of scabrous tubercles. Pappus snow-white, its bristles soft, densely plumose, inner ones longer, thicker above, somewhat barbed. Ligulate florets yellow, pink, or (as a result of drying?) lilac colored.

Series 26. Darvasicae Lipsch. in *Addenda XXVIII*, 722.—Stem tall, leafy to tip, internodes long. Capitula narrowly cylindrical.

60. **S. tadshikorum** Krasch. and Lipsch. in Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 49.—**lc.**: Lipsch. op. cit. (1935) Plate 18.

Perennial. Underground part and root collar not known; possibly, root reduced, a tuber. Stems 20–30 cm high, sulcate, slightly pubescent, dichotomously branched; branches (floral branches) simple or branched, 8–12 cm long. Leaves lanceolate, (5.5)7–11(14) cm long, 0.7–1.5(2) cm wide, narrowed below, amplexicaul, at base roundish or somewhat keeled with flat or barely undulate-crimped margins, veins except white midrib, indistinct; upper leaves reduced, with axillary flowering shoots; internodes long. Capitula narrowly cylindrical, 2–2.5 cm long. Involucre glabrous; bracts slightly membranous along margins; outer bracts small, deltoid-

- ovate; inner bracts oblong-lanceolate, subobtusate, longer than outer ones. Achenes terete, 7 mm long, slightly curved, somewhat tuberculate-toothed along ribs; pappus snow-white, its bristles soft numerous, plumose, five
94 inner bristles longer, barbed above. Flowering June.

Mountain slopes.—*Soviet Central Asia*: Pamiro-Alai (Darvaz, Childara). Described from Childara. Type in Leningrad.

Note. The species was described from insufficient material (a single herbarium sheet) and needs further study and observations in the field.

Series 27. Ferganicae Lipsch. in Addenda XXVIII, 722.—Stems scapellike, branched from middle; flowering branches numerous; leaves crowded at base of fork. Internodes shorter. Capitula narrowly cylindrical.

61. **S. ferganica** Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. I, 1 (1933) 180; Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 52.—**lc.**: Lipsch. op. cit. (1935) Plate 19.

Perennial. Plant weakly pubescent, glabrescent. Root thickened into tuber; root collar covered with long stramineous or brown sheaths. Stems scapellike, (8)10–16 cm high, dichotomously branched from middle; lateral branches (floral) (3)6–25, simple or branched, (3)8–12(15) cm long, unequal, bent, spreading. Leaves quite variable in form and size, with several veins and prominent midrib; basal leaves broadly linear, with yellow shining sheaths surrounding lower part of stem below branches and evidently embedded into stony soil; cauline leaves linear-lanceolate or lanceolate, more or less acuminate, orbicular or cuneate at base, amplexicaul; margin undulate-crimped, (3)4–8(10) cm long and 0.4–1.5(2) cm wide. Achenes narrowly terete, (2)2.5–3 cm long and 0.4–0.6 cm wide. Involucre glabrous, involucre bracts with narrow membranous margin; outer bracts small, ovate-deltoid, 4–6 mm long, obtuse; inner bracts lanceolate-linear, subobtusate, 2–2.5 cm long and 4–5 mm wide. Ligulate florets yellow, pinkish on outer side. Achenes 7–8 mm long, slightly curved, ribbed, somewhat densely tuberculate-toothed along ribs; pappus snow-white, soft, with many bristles, 12–14 mm long, plumose, inner bristles barbed above. Flowering June.

Stony-rubby slopes.—*Soviet Central Asia*: Pamiro-Alai. *General distribution*: Afghanistan. Described from Fergana. Type in Leningrad.

Series 28. Ovatae Lipsch. in Addenda XXVIII, 722.—Capitula broadly cylindrical. Ligulate florets yellow or pink (violet when dry). Achenes flattened-cylindrical, angular. Basal and lower cauline leaves ovate or oblong-lanceolate, with undulate-crimped or flat margin.

- 95 62. **S. ovata** Trautv. in Tr. Peterb. Bot. Sada, I, 2 (1872) 275; Lipsch. *Fragm. Monogr. Scorzonera I* (1935) 56; Popov in Tr. Uzb. Gos. Univ.

Nov. Ser. 27, Biol. 14 (1941) 91; Lipsch. in Fl. Turkm. VII (1960) 306; kovalevskaja in Fl. Uzb. VI, 443 (excl. syn. *S. crassifolia* Krasch. and Lipsch.).—**lc.**: Lipsch. op. cit. (1935) Plate 21 and 22; Lipsch. op. cit. (1960) Plate XLVII, 2.

Perennial. Plant (9)10-2-(35) cm high. Root thickened into oblong or roundish tuber; root collar covered with brown or stramineous shining sheaths. Stems leafy, especially in lower part, branched, flowering branches (2)5-15(20) cm long, slightly curved, (2)3-7(15). Basal and cauline leaves hard with pinnate venation, margin cartilaginous, undulate-crimped; lowermost leaves broadly ovate, acuminate, less often subobtusate, narrowed into petiole; middle cauline and those on branches reduced above, oblong-lanceolae, roundish at base, amplexicaul. Capitula broadly cylindrical, 2.5-3.5 cm long and 0.7-1 cm wide. Involucral bracts glabrous, coriaceous, membranous along margin, often bordered with red stripe; outer bracts ovate-deltoid, obtuse; inner ones oblong-lanceolate, subobtusate, much longer than outer. Ligulate florets yellow, far exerted from involucre. Achenes 6-7 mm long, weakly curved; flattened-cylindrical, angular-ribbed, transversely tuberculate-serrate; pappus snow-white, dense, soft, its bristles plumose, barbed above. Flowering April to May.

Clayey, sandy and stony-rubby steppes.—*Soviet Central Asia*: mountainous Turkmenia, ?Amu-Darya, Pamiro-Alai (Zeravshan). *General distribution*: ?Iran (northern); Indo-Himalayan (Afghanistan). Described from vicinity of Ashkhabd. Type in Leningrad.

Note. Var. *major* Bornm. and Sint. (in Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 56; Lipsch. in Fl. Turkm. VII, 306) is recognized, which is characterized by taller, up to 35 cm high, sturdier stem, longer flowering shoots (10)15-25 cm long), large (up to 15 cm long) leaves, and larger capitula (up to 3.5 cm long and 1.5 cm wide).

63. ***S. crassifolia*** Krasch. and Lipsch. in Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 60.—*S. ovata* ssp. *crassifolia* Krasch. and Lipsch. in sched., olim.—**lc.**: Lipsch. op. cit. (1935) Plate 23.

Perennial. Root thickened into oblong or roundish tuber; root collar covered with numerous brown or stramineous, shining sheaths. Stem short, (7)8-12 cm long, branched from middle, branches two to four, 2-7 cm long, terminating in solitary capitula. Leaves glaucous-green, fleshy, slightly tomentose or with powdery bloom, glabrescent, flat along margin; basal and lower cauline leaves broadly ovate, long-petiolate, subobtusate or with small cusp; middle cauline leaves and those on branches reduced, lanceolate or oblong-lanceolate, sessile, semiamplexicaul. Capitula broadly cylindrical, (2)2.5(3) cm long and (0.8)1-1.2 cm wide. Involucre glabrous, glaucous; involucral bracts coriaceous, margin partially or completely violet; outer bracts ovate-deltoid, smaller, obtuse; inner bracts

longer, oblong-lanceolate, narrowed toward apex, subobtusate, sometimes with parallel veins. Ligulate florets yellow, exserted from involucre. Achenes 6–7 mm long, flattened-cylindrical, slightly curved, angular-ribbed, transversely tuberculate-toothed; pappus snow-white, soft, dense, its bristles plumose, inner bristles longer, barbed above. Flowering April to May.

On conglomerates, stony slopes.—*Soviet Central Asia*: Pamiro-Alai (Fergana). Endemic. Described from Fergana. Type in Leningrad.

Note. The species is quite close to *S. ovata* Trautv., from which it differs in having fewer flowering shoots and more fleshy, subobtusate leaves with flat margins.

64. ***S. papposa*** DC. Prodr. VII, 1 (1838) 119; Boiss. Fl. or. III, 765; Post, Flora of Syr., Pal. and Syn. (1896) 493; Bordz. in Zap. Kiev. Obsch. Estestv. XXV, 1 (1915) 130; Bouloumoy, Fl. du Liban (1930) texte, 209; Grossh. Fl. Kavk. IV (1934) 238; Lipsch. Fragm. Monogr. Scorzonera I (1935) 64; II (1939) 17; Isaev in Fl. Azerb. VIII, 524.—*S. papposa* DC. var.? Stschégleew in Bull. Soc. Nat. Mosc. XXIV, 4 (1851)-473; XXVI, 2 (1853) 321.—*S. paradoxa* Fisch. and Mey. in DC. Prodr. VII, 1 (1838) 119.—*S. kurdica* Bois. and Noe in Boiss. Diagn. pl. or. ser. II, 3 (1856) 93.—*S. picridioides* Boiss. Fl. or. III (1875) 763 (p. min. p. quod plant. Szovitzian.).—**lc.**: Lipsch. op. cit. I (1935) Plate, 25; II (1939) Plate 1.

Perennial. Plant weakly tomentose, glabrescent. Root thickened into tuber; root collar almost glabrous. Stems (8)10–18(30) cm high, mostly thick, erect or slightly flexuous, sulcate, more or less strongly branched in upper part or from base; branches (floral) simple or in turn branched, usually many (2)3–7(12). Basal and lower cauline leaves petiolate, varying in size, ovate or oblong, somewhat obtuse or acuminate; middle leaves sessile, semiamplexicaul, long-acuminate; uppermost leaves reduced, lanceolate; all leaves coriaceous, with cartilaginous margin, usually highly undulate-crimped. Capitula large, on long peduncles, broadly cylindrical, (2.5)3–4 cm long, and (0.7)1–1.5 cm wide. Involucre glabrous; bracts coriaceous with membranous margin, sometimes bordered with lilac-colored stripe, obtuse; outer bracts short-ovate or ovate; inner bracts oblong-lanceolate, two to two and one-half times as long as outer. Ligulate florets violet, greatly exserted from involucre. Achenes (7)8–10 mm long, sharply tetraquetrous, white, strongly tuberculate-toothed; pappus dense, snow-white, its bristles plumose, inner bristles barbed above. Flowering May to June.

97 Dry slopes.—*Caucasus*: Southern Transcaucasia (Armenia, Nakhichevan). *General distribution*: Eastern Mediterranean, Armenia and Kurdistan, Iran. Described from Syria. Type in Geneva.

Section 14. Hissaricae Lipsch. Fragm. Monogr. Scorzonera II (1939)

63, pro subsect.—Root thickened into tuber. Stems simple, scape-like, weakly leafy. Capitula cylindrical or turbinate. Involucre of 8–12 bracts. Achenes large and glabrous, with longitudinal scabrous ribs. Ligulate florets yellow; pappus bristles stiff, wholly or at base blackish violet, plumose throughout.

65. **S. hissarica** Winkl. in Tr. Peterb. Bot. Sada XI (1889) 172; Lipsch. Sist. Zam. ob Aziat. Skorts. (1932) 13; Lipsch. Fragm. Monogr. Scorzonera II (1939) 63; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 92; Lipsch. in Fl. Turkm. VII (1960) 306; Kovalevskaja in Fl. Uzb. VI, 444.—*S. hissariae* Ind. Kew. Suppl. I (1901–1906) 388 (lapsu calami).—**lc.**: Lipsch. op. cit. (1932) 31, Fig. 7; Lipsch. op. cit. (1939) Plate 9.

Perennial. Root thickened into tuber; root collar covered with brown remnants of sheaths of basal leaves, sometimes producing two or three (five) stems. Stems sparsely leafy, scapelike, (6)10–20(30) cm long, simple, weakly pubescent, terminating in solitary capitula. Basal leaves broadly lanceolate or ovate-lanceolate, acuminate, slightly cartilaginous along margin, toothed, flat or undulate-crimped, glaucous, bloom subsequently disappearing, narrowed into petiole broadening at base into sheath; cauline leaves less numerous, sessile, lanceolate, narrower than basal ones. Capitula large, 2.5–3.5(4) cm long, broadly cylindrical or turbinate. Involucre of 8–12 bracts, pubescent or almost glabrous, outer bracts deltoid; inner ones ovate-lanceolate, two to three times as long as outer; all bracts subacute. Ligulate florets yellow, turning pink on drying. Achenes large, ribbed, toothed-scabrous along ribs; pappus bristles stiff, plumose, wholly or at base blackish-violet. Flowering April to June.

Varicolored low hills, stony-rubby slopes.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Hissar. Type in Leningrad.

Note. The species is extremely variable in the size of the organs, especially the leaves. Some specimens in their habit resemble *Scorzonera inconspicua* Lipsch., from which they can be distinguished easily by the structure of the achene and the pappus, particularly by its color.

Section 15. Nervosae Lipsch. in Lipsch. Fragm. Monogr. Scorzonera I (1935) 126.—*Lasiospora* Less. in DC. Prodr. VII, 1 (1838) 124, p. p. and in Boiss. Fl. or. III (1875) 756, p. p.—*Euscorzonera* DC. § *Tomentosae* Boiss. op. cit. III (1875) 756.—Large perennials with densely
98 leafy stems. Pubescence very dense, shining (velvety) or less dense, dull, tomentose, ash-colored (not velvety); sometimes plants almost glabrous. Leaves of variable width, usually large, ovate-elliptical or lanceolate, venation curvinerved, veins numerous. Achenes glabrous or pubescent. Pappus bristles soft, plumose or stiff, barbed-scabrous.

Series 29. Sosnovskyanae Lipsch. in Addenda XXVIII, 722.—Pubescence very dense, shining (velutinous). Leaf veins hairy. Leaves not undulate along margin. Achenes pubescent or glabrous.

66. **S. sosnovskyi** Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 142; Grossh. *Opred. Rast. Kavk.* 509.—*S. dzhawakhetica* Sosn. in Grossh. *Fl. Kavk.* IV (1934) 236, descr. ross.; Sosnowvsk. in *Tr. Tbil. Bot. Inst.* II (1938) 218; Papava in *Fl. Gruzii VIII*, 645.—*S. dzhawakhetica* Sosn. var. *viridescens* Sosn. in *Fl. Gruzii VIII* (1952) 646, descr. georg.—*S. nervosa* auct. fl. cauc. p. p. quoad pl. Georgiae.—*S. veratrifolia* auct. fl. cauc. p. p. (non Fenzl).—**!c.**: Lipsch. op. cit. (1935) Plate 49.

Perennial. Root thickened, vertical, cylindrical; root collar covered with indurescent remnants of leaf sheaths and petioles, whole plant velutinous-sericeous (after long preservation in herbarium, pubescence turns rusty). Stems numerous, hard, erect or slightly curved, leafy throughout, more or less highly branched (often dichotomous). Leaves flat, not undulate along margin, with many (7–10) veins, barely visible due to dense velvety pubescence; basal leaves ovate, obtuse or subobtuse, narrowed at base into sulcate, usually short, and slightly flattened petiole; lower cauline leaves with short flat petiole, slightly amplexicaul, broadly lanceolate or ovate, subobtuse; middle cauline leaves sessile or almost so, semiamplexicaul, ovate-lanceolate or lanceolate, all leaves reduced toward stem apex, subobtuse. Capitula turbinate, 1.8 cm long, solitary, on sulcate, pubescent or sometimes almost glabrous leafy branches; leaves often crowded near capitula. Involucre sparsely pubescent or almost glabrous; bracts sometimes with carinate midrib, membranous along margin; outer bracts small, ovate-deltoid, acuminate; inner bracts two to three times as long, lanceolate or oblong-lanceolate, acuminate. Ligulate florets yellow, slightly longer than involucre. Achenes densely white lanate; pappus two to two and one-half times as long as achenes, of rusty or yellowish hairs, plumose, barbed-scabrous above. Flowering August.

Stony-rubbly slopes and peaks, rock crevices.—*Caucasus*: Eastern Transcaucasia (Dzhavakhetia). Endemic. Described from Akhalkalaki Region (Tetrobo-Chobaret Range). Type in Moscow.

67. **S. ketzkhoveli** Sosn. in Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 145 (descr. latin.); Grossh. *Fl. Kavk.* IV (1934) 240 (descr. rossica); 99 Sosn. in *Tr. Tbil. Bot. Inst.* II (1938) 219 (descr. lain.); Grossh. *Opred. Rast. Kavk.* 510; Papava in *Fl. Gruzii VIII*, 647.—**!c.**: *Fl. Gruzii VIII*, Plate 434.

Perennial. Very similar to *S. sosnovskyi* Lipsch. Root strong, vertical, cylindrical; whole plant very densely velutinous-sericeous. Stems numerous, erect, sulcate, leafy up to inflorescence, apically with spreading one-headed branches. Basal leaves long-petiolate, ovate-lanceolate,

obtuse, with many (up to 10) veins, entire, not undulate; lower cauline leaves oblong-lanceolate, short-petiolate; higher leaves sessile, lanceolate, subacute, gradually reduced toward apex of stem. Capitula rather large (up to 2 cm long), peduncles almost glabrous, greenish. Involucre almost glabrous; outer bracts small, ovate-lanceolate, acuminate, almost membranous along margin. Ligulate florets yellow. Achenes (even when young) completely glabrous, obpyramidal, tetraquetrous; pappus reddish-rusty or dirty yellow, its bristles plumose almost to apex. Flowering July.

Stony-gravelly slopes and peaks, rock crevices—*Caucasus*: Eastern Transcaucasia (Dzhavakhetia). Endemic. Described from Akhalkalaki Region (Tetrobo-Chobaret Range). Type in Tbilisi.

Note. Very close to *S. sosnovskyi*, from which it differs by having completely glabrous achenes and ovaries, analogous to what is observed in the species pair *S. filifolia*–*S. lipskyi*.

Series 30. Latifoliae Lipsch. in Addenda XXVIII, 722.—Pubescence less dense, dull, tomentose, ash-colored (not velvety), sometimes plants almost glabrous. Leaves with very prominent veins and cartilaginous, undulate-crimped margins. Capitula many. Inflorescence paniculate. Achenes pubescent or glabrous (in species growing in Asia Minor).

68. *S. latifolia* (Fisch. and Mey.) DC. Prodr. VII, 1 (1838) 124; Grossh. Fl. Kavk. IV (1934) 236; Lipsch. Fragm. Monogr. *Scorzonera* I (1935) 133; II (1939) 24; Lipsch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, II (1936) 305; Grossh. Opred. Rast. Kavk. 509; Papava in Fl. Gruzii VIII, 646; Isaev in Fl. Azerb. VIII, 526.—*Lasiospora latifolia* Fisch. and Mey. Ind. Sem. Hort. Petrop. I (1835) 30.—*S. nervosa* Trev. Delect. Sem. Hort. Bonnens. (1833) non Lam. nec Pers.; opusc. non vidi; Linnaea (1835) 73; DC. op. cit. (1838) 125; Boiss. Fl. or. III, 779; Medved. in Tr. Tifl. Bot. Sada XVIII, 2 (1918) 307; Grossh. in Bot. Sborn. Azerb. GNII, I (1932) 50; Prilipko in Tr. Bot. Inst. Baku II (1936) 46; Sosn. in Tr. Tbil. Bot. Inst. II (1938) 224.—*Lasiospora nervosa* Sch. Bip. in Nov. Acta Acad. Caes. Leopold-Carol. Nat. Cur. XXI (1845) 166.—*S. paniculata* Boiss. Diagn. pl. or., ser. I, 7 (1846) 8.—*S. lasiospora* Boiss. and Balansa in Boiss. Diagn. pl. or. ser. II, 6 (1859) 118.—**lc.**: Lipsch. op. cit. (1935) Plates 45, 45a; Photos 6, 7; Fl. Azerb. VIII, Plate LIV.

100 Perennial. Root vertical, strongly thickened; root collar covered with indurescent sheaths and remnants of previous year's stem bases; whole plant pubescent, gray, less often almost glabrous to glaucous-green or green. Stems 20 cm to 1 m high, numerous (to 20 from single root), strong, erect, glabrous or slightly pubescent, sulcate, becoming glabrous and distinctly angular toward apex, densely leafy, with many branches above. Leaves hard, many-veined (5–15), variable in shape and width, with cartilaginous margins, more or less toothed-serrate, scabrous,

undulate-crimped; basal leaves narrowed into more or less long, sulcate petiole, lanceolate or broadly lanceolate, attenuate-acuminate, cusp callose, sometimes bent; cauline leaves lanceolate, oblong, broadly ovate-lanceolate; lower cauline leaves short-petiolate, petioles slightly flattened at base; middle and upper cauline leaves sessile, amplexicaul; all leaves gradually reduced upward. Capitula turbinate or cylindrical, 1.8–2.3 cm long (at flowering) and 1.8–2.5 cm (at fruiting), numerous, solitary (rarely in twos or threes), terminal on lateral branches bearing few small, linear or subulate leaves; flowering shoots forming pyramidal-paniculate compound inflorescence. Involucre pubescent, bracts hard, somewhat carinate; outer bracts small, deltoid, acuminate, cusps often bent; inner bracts lanceolate, much longer than outer, acuminate. Ligulate florets yellow, slightly longer than capitula. Achenes terete, narrowed at base, 7–10 mm long, densely white lanate; pappus rusty, as long as achene, its bristles densely plumose. Flowering June to August.

Dry stony slopes and screes.—*Caucasus*: Eastern and Southern Transcaucasia. *General distribution*: Armenia and Kurdistan. Described from Azerbaidzhan. Type in Leningrad.

Note. The species varies greatly in pubescence and form, as well as width of leaves. On the basis of pubescence, it is possible to distinguish: var. *glabrata* Trautv. (*Tr. Peterb. Bot. Sada* II (1873) 559)—stems in the upper part, upper leaves, and the involucre almost glabrous; var. *pubescens* Lipsch. nom. nov. (= var. *typica* Trautv. op. cit. 559)—whole plant and involucre more or less tomentose. Based on the form of the leaves, Prilipko (cf.: Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 136 and *Tr. Bot. Inst. Baku* II (1936) 46) recognized the following varieties: var. *macrophylla* Pril.—with broad cauline oval or ovate leaves (4–5.5 cm wide); var. *angustifolia* Pril.—leaves lanceolate, 1–1.5 cm wide; var. *media* Pril.—leaves usually undulate-crimped along the margin, 2.3–5 cm wide; var. *abbreviata* Pril.—leaves narrowly lanceolate (0.8–1.2 cm wide), flowering branches reduced; capitula densely aggregated, few (three to nine). Many plants do not fit this subdivision and are intermediate in character.

69. **S. pulchra** Lom. in *Tr. Tifl. bot. Sada* II (1897) 289; Grossh. in *Bot. Sborn. Azerb. GNII* I (1932) 50; Grossh. *Fl. Kavk.* IV (1934) 237; Lipsch. *Fragm. Monogr. Scorzonera* I (1935) 142; Grossh. *Opred. Rast. Kavk.* 509; Isaev in *Fl. Azerb.* VIII, 527.—**lc.**: Lipsch. op. cit. (1935) Plate 48.

Perennial. Plant densely white tomentose. Root cylindrical, thick; root collar covered with brown remnants of leaf sheaths. Stems densely white-tomentose, tall, (30)35–60 cm high, densely leafy, branched; branches ascending, slightly flexuous, varying in length, simple, axillary; forming almost corymbose compound inflorescence. Leaves white-tomentose, many-veined, veins covered by hairs, with cartilaginous border along

margin, usually undulate-crimped; basal leaves lanceolate, narrowed into petiole, broadened into sheath; cauline leaves sessile, weakly amplexicaul, broadly lanceolate or ovate, acuminate, cusps often subulate, sometimes curved; all leaves gradually reduced upward, uppermost leaves close to capitula lanceolate. Capitula (3)4–10, solitary terminal on flowering shoots in corymbose inflorescence, turbinate or broadly cylindrical, (1.5)2–2.2 cm long and 1–1.2(1.5) cm wide. Involucre white-tomentose, sometimes glabrescent; outer bracts smaller, deltoid-lanceolate; inner bracts oblong-lanceolate, often with carinate midrib, subobtusely acuminate much longer than outer bracts. Ligulate florets sulfur-yellow, longer than involucre. Achenes 7–8 mm long, with dense woolly pubescence; pappus dirty-yellow, its bristles plumose, hairs barbed above. Flowering June to August.

Dry slopes.—*Caucasus*: Eastern Transcaucasia. Endemic. Described from Karabakh (Ziarat Mountain). Type in Leningrad; isotype in Tbilisi.

Note. From the closest species *S. latifolia* (Fisch. and Mey.) DC., it is distinguished by having white-tomentose pubescence and a corymbose inflorescence.

From *S. sosnovskiyi* Lipsch. it is distinguished by having white-tomentose, less dense, and nonvelvety pubescence, acuminate and not obtuse leaves, etc.

70. *S. safievii* Grossh. in Bot. Sborn. Azerb. GNII I (1932) 51, descr. ross.; Tr. Azerb. Otd. Zakavk. Fil. Akad. Nauk SSSR, Sek. Bot. I (1932) 62, descr. latina; Grossh. Fl. Kavk. IV (1934) 237; Lipsch. Fragm. Monogr. Scorzonera I (1935) 138 Grossh. Oprod. Rast. Kavk. 509.—**lc.**: Lipsch. op. cit. (1935) Plate 47.

Perennial. Plant canescent. Root vertical; root collar covered with remnants of indurulent sheaths of basal leaves; sheaths often hairy on inner side; latex yellow. Stems 35–50 cm high, more or less pubescent, especially in lower part, usually many (up to eight), ascending at base, straight, relatively slender, sulcate, highly branched, densely leafy. Leaves hard, glaucous-green, linear-lanceolate, narrow, 3–5(8) mm wide, flat with many (three to seven) veins and subulate tip; basal leaves narrowed into sulcate, sometimes weakly carinate petiole; cauline leaves sessile, slightly amplexicaul; all leaves reduced upward. Capitula 1.5–2(2.5) cm long (at fruiting), usually many (3–20), solitary terminal on long flexuous branches—axillary peduncles. Involucral bracts rigid, pubescent, glabrescent, somewhat carinate, acuminate, with narrowly membranous margin; outer bracts small, deltoid, acuminate, often with bent cusps; inner bracts oblong-lanceolate, much longer than outer. Ligulate florets yellow, longer than involucre. Achenes terete, (6)7–10 mm long, densely white-lanate; pappus dirty yellow, its bristles rusty, densely plumose, barbed above. Flowering July to August.

Dry stony slope.—*Caucasus*: Southern Transcaucasia. Endemic. Described from Armenia (Daralagyoj). Type in Baku; isotype in Moscow.

Section 16. Vierhapperia Lipsch. *Fragm. Monogr. Scorzonera* II (1939) 88.—Plants covered with lanate pubescence. Stems leafy. Leaves (in species growing in the USSR) usually with prominent veins. Achenes in our species lanate (subsect. *Neovierhapperia* Lipsch. nom n. = *Euvierhapperia* Lipsch.). Pappus bristles wholly plumose.

Series 31. Biebersteinianae Lipsch. in *Addenda XXVIII*, 722.—Stems ascending or erect, not virgate. Leaves hard, mostly with prominent veins, apex narrowed into cusp. Capitula many-flowered (more than 20); achenes 5–7 mm long (excluding pappus).

71. **S. ensifolia** M.B. *Fl. taur.-cauc.* II (1808) 235 and III (1819) 523; *Ldb. Fl. Alt.* IV, 162; *DC. Prodr.* VII, 1, 124; *Ldb. Fl. Ross.* II, 2, 797; *Boiss. Fl. or.* III, 780; *Schmalh. Fl.* II, 144; *Krasch. in Fl. Yugo-Vost.* VI, 452; *Lipsch. Fragm. Monogr. Scorzonera* II (1939) 94; *Kryl. Fl. Zap. Sib.* XI, 2986.—*S. ensifolia* M.B. α . *glabrescens* and β . *pilosior* O. Ktze. in *Tr. Peterb. Bot. Sada*, X, 1 (1887) 205.—*S. ensifolia* var. *lanata* Serg. in *Kryl. Fl. Zap. Sib.* XI (1949) 2987.—*Lasiospermum ensifolium* (M.B.) *Fisch. Catal. Hort. Gorenk.* (1812) 34.—*Lasiospora ensifolia* (M.B.) *Cass. in Dict. sc. nat.* XXV (1822) 307; *Sch. Bip. in Nov. Acta Acad. Caes. Leopold.-Carol. Nat. Cur.* XXI (1845) 166.—*L. ensifolia* (M.B.) *Claus in Göbel, Reise* II (1838) 284.—*L. macrophylla* *Fisch. and Mey. Enum. pl. nov.* I (1841) 39.—*Scorzonera macrophylla* *Fisch. and Mey. Enum. pl. nov.* I (1841) 39 in adnot.; *Ldb. Fl. Ross.* II, 2, 797; *Lipsch. op. cit.* (1939) 47.—**Exs.**: GRF No. 1167.

Perennial. Root vertical, cylindrical; root collar sometimes covered with indurescent sheaths of basal leaves, densely velutinous from long rusty hairs. Stems 20–55 cm high, few, less often solitary, slightly flexuous, weakly sulcate, pubescent (often floccose in leaf axils), less often glabrous, densely leafy throughout, usually branched, less often simple. Leaves linear-lanceolate or linear, 6–25 cm long and 2–6(10) mm wide, apex attenuate into subulate bent cusps, hard, with many veins (rather distinct). Capitula solitary or two to four, terminal. Involucre more or less lanate-velutinous (sometimes pubescence forms “white collar” around involucre—var. *pilosior* O. Ktze.); involucre bracts lanceolate, long-acuminate; outer bracts reduced, with bent cusp. Ligulate florets yellow, one and one-half times as long as involucre. Achenes lanate; pappus dirty yellow or rusty, its bristles plumose from base, two to two and one-half times as long as achenes. Flowering (May) June to August.

Sandy steppes, hummocky and hilly sands, dunes, sandy steppe pine forests, lowlands.—*European Part*: Volga-Don, Trans-Volga, Black Sea

Region, Lower Don, Lower Volga; *Western Siberia*: Upper Tobol, Irtysh, Altai; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region, Kyzyl-Kum, Amu-Darya, Syr-Darya. *General distribution*: ?Dzhungaria-Kashgaria. Described from Caspian desert. Type in Leningrad.

Note. *Scorzonera macrophylla* Fisch. and Mey. (type preserved in Leningrad), described from sands of the Irtysh River, is the broad-leaved variant of *S. ensifolia* M.B.

72. **S. biebersteinii** Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 95; Isaev in Fl. Azerb. VIII, 527.—*S. eriosperma* M.B. Besch. Länd. zw. Terek und Kur. (1800) 117 and 28, non Gouan, 1773; Willd. Sp. pl. III, 3 (1803) 1504; M.B. Fl. taur.-cauc. II (1808) 236 and III (1819) 523; DC. Prodr. VII, 1, 124; Ldb. Fl. Ross. II, 2, 796; Boiss. Fl. or. III, 780; Grossh. Fl. Kavk. IV (1934) 237; Lipsch. op. cit. (1939) 95; Grossh. Opređ. Rast. Kavk. 509; Papava in Fl. Gruzii VIII, 647.—*Lasiospora eriosperma* (M.B.) Sch. Bip. in Nov. Acta Acad. Caes. Leopold.-Carol. Nat. Cur., XXI (1845) 165.—*Lasiospermum angustifolium* Fisch. Catal. Hort. Gorenk. (1812) 34, nomen nudum.—*Lasiospora angustifolia* Cass. in Dict. sc. nat. XXV (1822) 306.—**lc.**: M.B. Cent. pl. II, dec. II (1843) t. 69; Fl. Azerb. VIII, Plate LIII, 2.—**Exs.**: Herb. Fl. Cauc. No. 299; Pl. or. exs. No. 50.

Perennial. Plant more or less lanate (woolly pubescence most abundant near stem base and in leaf axils); root collars sparsely covered with membranous sheaths and woolly pubescence. Stems 10–30(50) cm high, several arising from single root, ascending at base, more or less branched, less often simple. Leaves narrowly linear, (1)2–2.5(3) mm wide, with subulate apex, undulate, three(five)-veined; cauline leaves slightly amplexicaul. Capitula turbinate or ovoid, 1–10 (up to 22!) on single plant (depending upon nature of stem branching), small, 1.2–1.5(1.9) cm long. Involucre weakly pubescent, often almost glabrous; outer bracts small, deltoid, with short cusp; inner bracts lanceolate, much longer than outer, sometimes with distinct carinate midrib. Ligulate florets yellow, turning pink on drying, a quarter longer than involucre. Achenes obovoid, at base acute, lanate; pappus dirty yellow or rusty, its bristles plumose throughout. Flowering May to July. (Plate VI, Fig. 2.)

104 Stony and clayey slopes, sands.—*Caucasus*: Ciscaucasia, Dagestan, Eastern and Southern Transcaucasia. Endemic. Described from Konstantinogorsk. Type in Leningrad.

Note. The following variants are distinguished: f. *lanata* Lipsky—stems, peduncles, and involucre lanate; var. *apscheronica* Lipsch., highly branched, with relatively small capitula. There are specimens in the herbarium of the Botanical Institute, Academy of Sciences of the USSR, with the label "Turcomania, Karelin 1838;" the plants were undoubtedly collected from the Caucasus.

Series 32. Ramosissimae Lipsch. in Addenda XXVIII, 723.—Stems virgate, flexuous, erect. Leaves softer, without distinct cusp at apex. Capitula few-flowered (with six or seven flowers). Achenes 9–10 mm long (excluding pappus).

73. *S. ramosissima* DC. Prodr. VII, 1(1838) 125; Boiss. and Buhse in Mém. Soc. Nat. Mosc. XII (1860) 139; Boiss. Fl. or. III, 781; Grossh. in Bot. Sborn. Azerb. GNII, I (1932) 51; Grossh. Fl. Kavk. IV (1934) 237; Lipsch. Fragm. Monogr. Scorzonera II, 139; Grossh. Opred. Rast. Kavk. 509; Isaev in Fl. Azerb. VIII, 528.—*S. eriosperma* auct. non M.B.: Auch. ex DC. Prodr. VII, 1 (1838) 125.

Perennial. Plant with appressed pubescence. Root collar covered with indurescent, undivided or fibrous, sheaths of basal leaves and rusty woolly pubescence. Stems few, 25–45 cm high, straight, upright, virgate, sulcate, pubescent, simple below, dichotomously branched from middle. Leaves linear, herbaceous, with silky-rusty hairs, flat or slightly folded lengthwise, with three indistinct veins, somewhat obtuse; basal leaves 6–8 cm long and 1.5–2 mm wide, broadened at base into membranous, whitish, deltoid-lanceolate sheaths; cauline leaves reduced, filiform. Capitula solitary, on long slender flowering shoots, with few (six or seven) flowers, turbinate, 1–1.5(1.8) cm long (at flowering), 1.8–2.2 cm (at fruiting). Involucre pubescent or almost glabrous (var. *glabrescens* Grossh.); outer bracts small, acuminate, with blackish, slightly bent tip; inner bracts lanceolate, considerably longer than outer ones, with more or less distinct midrib. Ligulate florets yellow, slightly longer than involucre. Achenes 9–10 mm long, densely lanate, narrowly-terete, narrowed at base, ribbed, almost as long as pappus; pappus of plumose bristles. Flowering May to July.

Limestone deposits.—*Caucasus*: Southern Transcaucasia (Nakhichevan ASSR). *General distribution*: Iran. Described from Elvend Mountain. Type in Geneva.

Section 17. Tuberosae Lipsch. Fragm. Monogr. Scorzonera II (1939) 39.—Sect. *Lasiospora* Less. Synops. Compos. (1832) 134, p. p.; DC. Prodr. VII, 1 (1838) 124, p. p.; Ldb. Fl. Ross. II, 2 (1845–1846) 796, p. p.; Sch. Bip. in Nova Acta Acad. Caes. Leopold.-Carol. Nat. Cur. XXI 105 (1845) 166, p. p.; Boiss. Fl. or. III (1875) 776, p. p.—Plants usually small; root thickened into ovoid-spherical tuber. Achenes lanate. Receptacle pubescent (in all species?).

Subsection 1. Lanatae Lipsch. in Addenda XXVIII, 723.—Stems simple, unbranched.

74. **S. lanata** (L.) Hoffm. in Comm. Soc. Phys.-Med. Mosq. I (1806) 9; M.B. Fl. taur.-cauc. II (1808) 237 and III (1819) 524; DC. Prodr. VII, 1, 124, p. max. p.; Ldb. Fl. Ross. II, 2, 797; Boiss. Fl. or. III, 776, p. min. p.; Grossh. in Bot. Sborn. Azerb. GNII, I (1932) 50; Grossh. Fl. Kavk. IV (1934) 235; Lipsch. Fragm. Monogr. Scorzonera I (1939) 41; Grossh. Opred. Rast. Kavk. 509; Papava in Fl. Gruzii, VIII, 645; Isaev in Fl. Azerb. VIII, 528, p. p.—*Leontodon lanatus* L. Amoenit. acad. IV (1759) 287, excl. syn. nonn.—*Tragopogon lanatus* (L.) Willd. Sp. pl. III, 3 (1803) 1495.—*Troximon lanatum* (L.) Pers. Synops. II (1807) 360.—*Lasiospora lanata* (L.) Fisch. in Bull. Soc. Nat. Mosc. VI (1833) 257; C. Koch in Linnaea XVII (1843) 275.—*L. lanata* (L.) Fisch. and Mey. ex Lipsch. op. cit. (1939) 41, p. p.—? *L. tuberosa* Cass. *β. latifolia* Sch. Bip. in Nova Acta Acad. Caes. Leopold.-Carol. Nat. Cur. XXI (1845) 166.

Perennial. Root thickened into ovoid-spherical tuber. Whole plant, especially leaves and stems, densely lanate. Stems scape-like, (7)10–22 cm high, solitary, one-headed, erect, usually much longer than leaves. Leaves linear-lanceolate, margin flat or undulate-crimped; basal leaves sheathed at base, often half as long as stem, with indistinct veins, mostly lanate (sometimes veins rather prominent on clearing woolly pubescence). Capitula large, up to 2–2.5 cm long (including ligulate florets). Involucre lanate, especially outer bracts; involucre bracts lanceolate, outer ones almost half or two-thirds as long as inner ones. Ligulate florets one and one-half to two times as long as involucre bracts, lemon-yellow. Achenes narrowed at base, lanate; pappus rusty, its bristles stiff, plumose, barbed above; receptacle pubescent. Flowering May to June.

Dry slopes.—*Caucasus*: Dagestan. Endemic. Described from Derbent. Type in Moscow.

75. **S. pseudolanata** Grossh. in Tr. Bot. Inst. Baku II (1936) 258, descr. latin.; Grossh. Fl. Kavk. IV (1934) 235, descr. ross.; Lipsch. Fragm. Monogr. Scorzonera II (1939) 42; Grossh. Opred. Rast. Kavk. 509.—*S. lanata* auct. non Hoffm.; DC. Prodr. VII, 1 (1838) 124, p. min. p.; Boiss. Fl. or. III (1875) 776, quoad pl. Iran.; Isaev in Fl. Azerb. VIII, 528, p. p.—*S. lanata* ssp. *pseudolanata* (Grossh.) Lipsch. op. cit. (1939) 43, in syn.

Perennial. Root tuberous. Whole plant, especially leaves, lanate. Stems scape-like, short, 3–6(10) cm high, at fruiting bent, drooping, often procumbent. Leaves linear-lanceolate, up to 0.6–0.8 cm wide, as long as or slightly shorter than stems, flat along margin, sometimes more or less undulate-crimped, often uncinat. Capitula 0.4–1(1.2) cm long (at flowering). Involucre with lanceolate, slightly pubescent bracts;

outer ones (particularly at flowering) densely lanate, smaller; inner ones less pubescent, longer than outer. Ligulate florets orange-yellow, barely exerted from involucre (always ?). Achenes lanate; pappus rusty, its bristles plumose. Flowering April to June.

Dry slopes.—*Caucasus*: Southern Transcaucasia. *General distribution*: Armenia and Kurdistan, Iran. Described from Armenia and Nakhichevan. Type in Baku.

Note. A small race, very close to *S. lanata* (L.) Hoffm., with a series of transitional forms. Distinguished from *S. lanata* (L.) Hoffm. by its shorter size, bent, often drooping or procumbent stems, leaves as long as the stems, smaller capitula, and orange-yellow ligulate florets barely exerted from the involucre.

Subsection 2. Tuberiferae Lipsch. in Addenda XXVIII, 723.—Stems branched.

Series 33. Nutantes Lipsch. in Addenda XXVIII, 723.—Peduncles pendant. Leaves softer, with somewhat prominent veins.

76. *S. tuberosa* Pall. Reise III (1776) 757; M.B. Fl. taur.-cauc. II, 236; Ldb. Fl. Alt. IV, 163; DC. Prodr. VII, 1, 118; Ldb. Fl. Ross. II, 2, 796; Boiss. Fl. or. III, 777, p. p.; Lipsch. and Krasch. in Byull. Mosk. Obshch. Isp. Priro. Otd. Biol. XLIII, 1 (1934) 139; Lipsch. Fragm. Monogr. Scorzonera II (1939) 48; Kryl. Fl. Zap. Sib. XI, 2985; Lipsch. in Spisok Rast. Gerb. Fl. SSSR XIII, 132.—*S. tuberosa* var. *canescens* Bge. Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As., i. e. Lehmann reliq. bot. etc. (1851) 200 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 376.—*Lasiospora tuberosa* (Pall.) Claus in Cöbel, Reise (1838) 284.—*L. tuberosa* α. *angustifolia* Sch. Bip. in Nova Acta Acad. Caes. Leopold.-Carol. Nat. Cur. XXI (1845) 166.—**lc.**: Pallas, Reise III (1776) t. Y, fig. 3; Lipsch. and Krasch. op. cit. (1934) 139, Fig. 1; Lipsch. op. cit. (1939), Plate 4, Fig. 1.—**Exs.**: GRF No. 4000.

Perennial. Small spring desert plant with tuberous root; root collar covered with gray or rusty woolly pubescence and less numerous, shining, membranous scales. Stems solitary, less often 2–5, straight or slightly flexuous, (3)4.5–8.5(11) cm high, pubescent, usually branched, with two or three slender, flowering branches. Leaves usually longer than stem or shorter, linear or linear-lanceolate, 1–3(5) mm wide, slightly pubescent or almost glabrous, with three indistinct veins. Capitula small, cylindrical or turbinate, 3–8(15) on single plant. Involucre slightly pubescent, bracts membranous along margins, sometimes reddish-violet; outer bracts small, deltoid or triangular-ovate, appressed to inner bracts, mostly with uncinat cusps; inner bracts lanceolate. Ligulate florets yellow, reddish when dry,

slightly exserted from involucre. Achenes lanate; pappus plumose, its bristles sometimes violet at tips, barbed-scabrous. Flowering April to May.

Steppes, sands.—*European Part*: Lower Volga, Trans-Volga (southern part); *Western Siberia*: Upper Tobol, Irtysh; *Soviet Central Asia*: Aralo-Caspian Region. Described from Caspian semidesert. Type in London.

77. *S. sericeo-lanata* (Bge.) Krasch. and Lipsch. in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLIII, 1 (1934) 141; Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 49; Kovalevskaja in Fl. Uzb. VI, 444.—*S. tuberosa* var. *sericeo-lanata* Bge. Beitr. z. Kenntn. d. Fl. Russl. und Stepp. Centr.-As., i. e. Lehmann reliq. bot. etc. (1851) 200 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1954) 376.—*S. tuberosa* var. *graminifolia* Winkl. ex Lipsch. and Krasch. op. cit. (1934) 141, pro syn.—*S. tuberosa* var. *polycephala* Rgl. and Schmalh. ex Lipsch. and Krasch. op. cit. (1934) 141, pro syn.—*S. tuberosa* subsp. *sericeo-lanata* Krasch. and Lipsch. in Lipsch. op. cit. (1939) 49, pro syn.—*lc.*: Lipsch. and Krasch. op. cit. (1934) 142, Fig. 2; Lipsch. op. cit. (1939) Plate 4, Figs. 2–3.

Perennial. Root tuberous. Stems (8.5)10–20(25) cm high, solitary or two to five, erect or somewhat flexuous, sulcate, lanate, (hairs long, white, soft, silky, and mostly divergent), branched; branches somewhat bent. Leaves linear, 2–5 mm wide, attenuate-acuminate, lanate, with three to five indistinct veins, flat along margin; cauline leaves sessile, sometimes slightly amplexicaul. Capitula 5–7(25) on single plant, turbinate or less often cylindrical, on straight or somewhat bent peduncles (at flowering); peduncles pendant at fruiting. Involucral bracts pubescent, membranous along margin; outer deltoid, one-third to half, sometimes one-fifth as long as inner, lanceolate, appressed to inner bracts, cusps mostly straight. Ligulate florets yellow, slightly exserted from involucre. Achenes 5–7 mm long, densely lanate; pappus 10–12(20) mm long, its bristles plumose, barbed-scabrous above. Flowering April to May.

Sands.—*Soviet Central Asia*: Aralo-Caspian, Balkhash Region, Karakum, Kyzyl-Kum, Amu-Darya; *Western Siberia*: Irtysh. *General distribution*: Dzhungaria-Kashgaria (Kuldzha), Afghanistan. Described from sands of Kyzyl-Kum. Type in Leningrad.

78. *S. bungei* Krasch. and Lipsch. in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLIII, 1 (1934) 144; Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 52; Kovalevskaja in Fl. Uzb. VI, 444.—*S. tuberosa* var. *crispa* Bge. Beitr. z. Kenntn. d. Fl. Russl. u. Stepp. Centr.-As. i. e. Lehmann reliq. bot. etc. (1851) 200 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 376.—*S. tuberosa* subsp. *bungei* Krasch.

and Lipsch. in Lipsch. op. cit. (1939) 52, pro syn.—**lc.**: Lipsch. and Krasch. op. cit. (1934) 145, Fig. 3; Lipsch. op. cit. (1939) Plate 5.

Perennial. Root tuberous; root collar sometimes swollen, covered with woolly pubescence and numerous membranous scales, falling off later. Stems 5(10)–15(18) cm high, solitary or two or three, sulcate, canescent, distinctly branched; branches axillary, terminating in solitary capitula. Leaves broadly lanceolate (basal) to oblong-lanceolate, (0.4) 0.5–1(2) cm wide, flat or slightly undulate, with appressed hairs on both sides and indistinct veins; basal leaves narrowed into petioles broadened into sheaths; cauline leaves sessile, semiamplexicaul, reduced upward; leaves on peduncles filiform. Capitula 3–10(18), cylindrical when young, later turbinate; peduncles more or less bent during flowering, pendent on fruting. Involucre canescent; outer bracts small, one-fifth to one-fourth as long as inner, mostly uncinat at apex; inner ones lanceolate, narrowly membranous along margin. Ligulate florets light yellow. Achenes 6–7 mm long, whitish-lanate; pappus 9 mm long, its bristles plumose, hairs barbed-scabrous above. Flowering March to April (May).

Rubby-stony outcrops.—*Soviet Central Asia*: Kyzyl-Kum (outlier ranges of Bukantau, Sultan-Uiz-Dag, etc.). Endemic. Described from Sultan-Uiz-Dag. Type in Leningrad.

Series 34. Erectae Lipsch. in Addenda XXVIII, 723.—Peduncles upright. Leaves hard with prominent veins.

79. **S. gageoides** Boiss. Diagn. pl. or. ser. II, 3 (1856) 95; Boiss. Fl. or. III, 777; Lipsch. Fragm. Monogr. Scorzonera II (1939) 45; Kovalevskaja in Fl. Uzb. VI, 445.—*S. macrophylla* auct. non Fisch. and Mey.; Bge. Beitr. z. Kenntn. d. Fl. Russl. u. Stepp. Centr.-As., i. e. Lehmann reliq. bot. etc. (1851) 200 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 376.—*S. fischeriana* Krasch. and Lipsch. in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLIII, 1 (1934) 146.—*S. crassinervia* Fisch. ex Lipsch. and Krasch. op. cit. (1934) 146, nomen.—*S. tuberosa* var. *crispa* Rgl. ex Lipsch. and Krasch. op. cit. (1934) 146, pro syn., non Bge.—**lc.**: Lipsch. and Krasch. in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. XLIII, 1 (1934) 147, Fig. 4; Lipsch. op. cit. (1939) Plate 3.

Perennial. Root cylindrical, tuberous; root collar (very rarely thickened) lanate and covered with less numerous membranous scales, later drying out. Stems solitary (less often two or three), 5–20 cm high, distinctly sulcate, leafy, whitish tomentose- or lanate, branched; branches axillary at acute angles, terminating in solitary capitula. Leaves hard, almost coriaceous, pubescent on both sides, flat, (3)5–11 veined, veins hard, white, very prominent, basal leaves broadly lanceolate, less often

ovate, (0.7)2–3 cm wide and (3)10–15(17.5) cm long, almost as long as stem or very rarely even exceeding it, narrowed at base into petiole, long-acuminate, often with dry cusp, sometimes spiny, weakly bent; cauline leaves alternate or (at point of branching) sometimes almost opposite, reduced upward, more or less broadly lanceolate, usually longer than axillary flowering shoots. Capitula usually many, (2) 3–14 (30), in indistinct corymbose inflorescence, erect. Involucral bracts coriaceous, pubescent, lanceolate, membranous along margin, their cusps more or less curved; inner bracts almost two times as long as outer. Ligulate florets yellow, longer than involucre. Achenes 7–8 mm long, densely lanate; pappus of plumose bristles. Flowering April to May.

Stony-rubbly slopes, sands.—*Soviet Central Asia*: Kyzyl-Kum (outlier ranges). *General distribution*: Iran-Afghanistan (Baluchistan). *S. gageoides* Boiss. described from Baluchistan. Type in Geneva.

Note. *S. fischeriana* Krasch. and Lipsch. described from Kyzyl-Kum. Type in Leningrad.

80. *S. circumflexa* Krasch. and Lipsch. in Byull. Mosk. Obshch. Isp. Priir. Otd. Biol. XLIII, 1 (1934) 148; Lipsch. Fragm. Monogr. Scorzonera II (1939) 54; Kovalevskaja in Fl. Uzb. VI, 445.—*S. tuberosa* var. *crispa* auct. fl. turkest. pro max. parte, non Bge.—*S. lanata* auct. non Hoffm.: Herd. in Bull. Soc. Nat. Mosc. XLV (1872) 370.—?*S. tuberosa* var. *glaberrima* Bge. Beitr. z. Kenntn. d. Fl. Russl. u. Stepp. Centr.-As. i. e. Lehmann reliq. bot. etc. (1851) 200 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 376.—*S. tuberosa* subsp. *circumflexa* Krasch. and Lipsch. in Lipsch. op. cit. (1939) 54 pro syn.—**!c.**: Lipsch and Krasch. op. cit. (1934) 150, Fig. 5; Lipsch. op. cit. (1939) Plate 6.

Perennial. Root cylindrical, tuberous; root collar (sometimes thickened) covered with rusty or grayish-woolly pubescence and less numerous shining membranous scales. Stems (5)8–15(25) cm high, solitary or two or three, more or less sulcate, pubescent, leafy, distinctly branched (very rarely simple); branches with solitary capitula. Leaves hard, almost coriaceous, pubescent on both sides or sericeous-lanate, along margins with cartilaginous stripe and usually highly undulate-crimped, acuminate, often rolled; lamina three- to seven- veined, veins hard, rather prominent; basal leaves mostly broadly lanceolate, (0.5) 0.8–1.5 cm wide, narrowed into petiole; cauline leaves sessile, oblong-lanceolate, reduced upward, alternate or sometimes opposite at point of branching. Capitula (2)4–10 per plant, usually on long, straight peduncles, in indistinct corymbose inflorescence. Involucre pubescent; involucral bracts membranous along margin; outer ones small, inner
110 bracts two or three times as long as outer. Achenes 6–7 mm long, densely

lanate; pappus up to 9 mm long, its bristles plumose, barbed-scabrous above. Flowering April to May.

Stony-rubbly slopes of mountains, outcrops of conglomerates.—*Soviet Central Asia*: Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: Afghanistan. Described from Fergana. Type in Leningrad.

Note. In places of contact with *S. tuberosa* Pall. and *S. sericeo-lanata* Krasch. and Lipsch. it "loses its purity" (leaves less hard, narrower, veins not so prominent, and peduncles pendant); however, the main characteristic—undulate leaf margins—is maintained. This tendency is observed in the Chu-Ili Mountains, Syr-Darya Karatau and other places.

81. *S. litvinovii* Krasch. and Lipsch. in Byull. Mosk. Obshch. Isp. Priro. Otd. Biol. XLIII, 1 (1934) 153 (*S. litwinowi*); Lipsch. Fragm. Monogr. Scorzonera II (1939) 54; Lipsch. in Fl. Turkm. VII (1960) 309.—*S. tuberosa* auct. fl. turkest. quoad. plant turcom.—*S. tuberosa* ssp. *litvinovii* Krasch. and Lipsch. in Lipsch. op. cit. (1939) 54, pro syn.—*S. codringtonii* Rech. f. in Oesterr. Bot. Zeitschr. 97 (1950) 263; Symb. Afghan. II (1955) 191.—**lc.**: Lipsch. and Krasch. op. cit. (1934) 154, Fig. 6; Lipsch. op. cit. (1939) Plate 7; Lipsch. op. cit. (1960) Plate XLVII, 1; Rech. f. op. cit. (1955) fig. 132, 137.

Perennial. Root tuberous; root collar more or less densely covered with rusty-woolly pubescence and less numerous membranous scales that subsequently drop off. Stems one to three, erect or slightly bent, (7)12–25(30) cm high, pubescent, leafy, branched; branches usually slightly bristly, often virgate after flowering, upright, terminating in solitary capitula. Leaves sessile, semiamplexicaul, hard, almost coriaceous, linear-lanceolate, (2)3–5(10) mm wide, long-attenuate at apex, almost subulate, flat, less often somewhat undulate, pubescent beneath, less often lanate, with three to five prominent veins; all leaves reduced upward. Capitula (3)7–12 on single plant, cylindrical or turbinate. Involucre pubescent; bracts slightly membranous along margin; outer bracts half as long as inner ones, lanceolate, more or less appressed to latter. Ligulate florets yellow, turning pink on drying. Achenes 5–7 mm long, lanate; pappus 10–13 mm long, plumose, its bristles plumose, reddish, barbed-scabrous above. Flowering April to May.

Steppes, sands.—*Soviet Central Asia*: mountainous Turkmenia, Pamiro-Alai. *General distribution*: Iran, Afghanistan. Described from vicinity of Kushka. Type in Leningrad.

82. *S. oxiana* M. Pop. in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 91.

Perennial. Root thickened into irregular tuber strongly tuberculate in lower part. Stems 5–7 cm high. Leaves narrowly lanceolate, without

prominent longitudinal veins. Capitula mostly solitary. Involucre 8–10 mm long.

- 111 Juniper forests up to subalpine zone, stony slopes of semisteppe zone.—*Soviet Central Asia*: Pamiro-Alai. Described from the Sangi-Dzhuman and Kuli-Kalon mountains (Kugistan). Type in Tashkent (?).

Note. I did not see specimens of this species. Kovalevskaja (*Fl. Uzb.* VI (1962) 444) relegated this species to synonymy under *S. sericeo-lanata* Krasch. and Lipsch. Such a treatment raises doubt. Therefore, tentatively I am retaining this, to me, obscure species so as to attract the attention of collectors.

GENUS 1636. *Epilasia* (Bge.) Benth.^{1, 2}

Benth and Hook. f. *Gen. pl.* II (1873) 532; Bge. *Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As.*, i. e. Lehmann reliq. bot. etc. (1851) 200–203 (seorsum impressum) and *Mém. Acad. Sc. Pétersb. div. sav.* VII (1854) 376–379, pro sect. generis *Scorzonerae*; Clark, *Comp. Ind.* (1876) 279, pro gen.; Hook. f. in *Fl. Brit. Ind.* III (1881) 419, pro gen.; Grossh. in *Bot. Sborn. Azerb. GNII I* (1932) 56, pro gen.; Lipsch. *Fragm. Monogr. Scorzonera II* (1939) 27–34, pro gen.; Soják in *Nov. bot. Horti Bot. Univ. Prag.* (1962) 49, pro gen.

Capitula ovoid-cylindrical. Involucre two-rowed; outer bracts three to six, leafy, often longer than inner or almost as long, erect or divergent; inner bracts coriaceous-membranous, less numerous. Receptacle flat, glabrous. Corolla ligulate, five-toothed, pale yellow, pink or lilac when dry; outer ligulate florets longer, exerted from involucre; inner ones much smaller than outer. Anthers sagittate at base, auricles pointed or short-setose. Stigmatic branches slender. Achenes black or gray, terete, basally slightly broadened into short hollow stalk, ribbed, sometimes without ribs; ribs (5–10), retrorsely barbate; achenes of two types: 1) with apical ring from which pappus arises; and 2) callous ring in middle of achene, its upper half covered with woolly hairs, continuing into pappus. Pappus dense, ash gray or rusty, five of its bristles (rarely more) fragile, barbed at tip, rest long-plumose. Annuals, with soft grayish pubescence, less often glabrous.

Type of genus: *E. hemilasia* (Bge.) Clarke.

The genus includes three or four species.

¹Treatment by S.J. Lipschitz.

²From the Greek words: *epi*—above; and *lasios*—densely woolly; from the nature of the upper half of achenes.

1. Outer ligulate florets large, up to 2.5 cm long, highly exserted from involucre; inner ligulate florets numerous, much shorter (one-third to half) than outer; all florets pink or lilac 1. **E. mirabilis** Lipsch.
- + Outer ligulate florets smaller, slightly exserted from involucre; inner ligulate florets numerous, shorter than peripheral ones; all florets pale yellow (cream-colored) 2.
2. Callous ring at tip of achene, upper part of achene not covered with woolly hairs; ribs of achene usually inconspicuous (except lower part) 2. **E. acrolasia** (Bge.) Clarke
- + Callous ring in middle of achene, upper part of achene covered with woolly hairs, continuing into pappus; ribs of achene usually rather conspicuous 3. **E. hemilasia** (Bge.) Clarke

1. **E. mirabilis** Lipsch. in Tr. Bot. Sada Mosk. Univ. 3 (1940) 176; in Fl. Turkm. VII (1960) 310; Fragm. Monogr. *Scorzonera* II (1939) 37, pro syn.; Kovalevskaja in Fl. Uzb. VI, 447.—*E. aerolasia* var. *macrocephala* Lipsch. op. cit. (1939) 37.—*E. acrolasia* var. *ammophila* auct. non Kuntze; Lipsch. op. cit. (1939) 37, p. p.—?*Scorzonera* (*Epilasia*) *monocarpica* Kitam. in Acta Phytotax. et Geobot. XVII (1957) 38; Ej. Fl. Afghan. (1960) 441.—**lc.**: Lipsch. op. cit. (1960) Plate XLVIII, Fig. 1; Kitam. op. cit. (1960) fig. 102.

Annual. Stem simple or branched, erect or ascending, often solitary, less often several, glabrous or weakly pubescent, 7–40 cm high. Leaves ovate-oblong or lanceolate, more or less pubescent; basal and lower cauline leaves petiolate; all leaves somewhat amplexicaul, cartilaginous along margin, finely toothed. Outer ligulate florets large, up to 2.5 cm long, considerably exserted from involucre, pink or lilac when dry; inner ligulate florets much smaller (one - third to half as long as outer ones). Involucre almost glabrous or somewhat pubescent, outer bracts leafy, as long as inner ones or much longer. Achene terete, with callous ring at tip leaving upper part of achene not covered by woolly hairs; mature achenes black, often weakly pubescent, especially along ribs, with short hollow stalk; ribs sometimes inconspicuous, in lower part always conspicuous, with small spinules. Flowering April to May.

Sands, clay, gypsiferous outcrops, loess hills.—*Soviet Cental Asia*: Kara-Kum, mountainous Turkmenia, Amu-Darya, Pamiro-Alai. *General distribution*: Afghanistan, ?Iran. Described from Soviet Central Asia. Type in Leningrad.

Note. I did not see the type of *Scorzonera monocarpica* Kitam.—the species described from Nuristan (Afghanistan); it is preserved in the herbarium of Kyoto University. Judging from the description and figure, *S. monocarpica* evidently is identical to *E. mirabilis*.

2. **E. acrolasia** (Bge.) Clarke, Comp. Ind. (1876) 279; Lipsch. Fragm. Monogr. *Scorzonera* II (1939) 35 (excl. var. *macrocephala* Lipsch.) and in Fl. Turkm. VII, 311; Kovalevskaja in Fl. Uzb. VI, 447.—*E. acrolasia* (Bge.) Soják in Nov. bot. Horti Bot. Univ. Prag. (1962)
- 113 49.—*Scorzonera acrolasia* Bge. Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As., i. e. Lehmann reliq. bot. etc. (1851) 202 (seorsum impressum) and Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 378; Boiss. Fl. or. III, 782.—*Epilasia hemilasia* var. *acrolasia* Kuntze in Tr. Peterb. Bot. Sada X, 1 (1887) 201, in adnot.—*Scorzonera acrolasia* var. *angustifolia* Winkl. in Tr. Peterb. Bot. Sada XI, 1 (1890) 151.—*Scorzonera ammophila* Bge. op. cit. (1851) 202 and op. cit. (1854) 378; Boiss. Fl. or. III, 782.—*Epilasia ammophila* (Bge.) Clarke, Comp. Ind. (1876) 279.—*Epilasia bungeana* Clarke op. cit. (1876) 279, p. p.—*Epilasia acrolasia* var. *ammophila* Kuntze op. cit. (1887) 201, in adnot.; Lipsch. op. cit. (1939) 37, p. p.—**lc.**: Fl. Uzb. VI, Plate XLIV, Fig. 1.

Annual. Canescent or almost glabrous [var. *ammophila* (Bge.) Kuntze] plants. Stems 6–35 cm high, solitary, or several, erect, ascending or less often even prostrate, simple or branched, sulcate, often hollow in lower part, weakly pubescent, at places floccose-tomentose, glabrescent. Leaves lanceolate or ovate-lanceolate, (1)2.5–5 cm long and 0.3–2 cm wide; basal and lower cauline leaves narrowed into distinct, usually flattened, petiole; upper cauline leaves sessile; all leaves somewhat amplexicaul, with three to five prominent veins, margin flat or undulate-crimped, more or less small toothed (seen under hand lens!), obtuse or acute, cartilaginous. Capitula ovoid-cylindrical, usually numerous, less often solitary, terminal on stem and branches; peduncles slightly thickened below capitula. Involucre more or less pubescent, glabrescent, sometimes glabrous (var. *ammophila* (Bge.) Kuntze); outer involucral bracts leafly, linear-lanceolate, with somewhat ciliate, triangular or ovate base, small-toothed along margin, apex with cartilaginous, sometimes bent cusp, shorter than inner bracts, as long or distinctly longer (var. *ammophila* (Bge.) Kuntze); inner involucral bracts 15–20 mm long, slightly membranous along margin. Outer ligulate florets pale yellow (cream-colored), exserted from involucre; inner florets smaller than outer. Achenes black, cylindrical, slightly narrowed toward base, glabrous or weakly pubescent, usually with indistinct ribs (sometimes ribs rather prominent, particularly distinct in lower and hollow part of achene stalk), spinulose or hairy along ribs; callous ring apical, leaving upper half of achene bare, not covered by pappus wool, as in *Epilasia hemilasia*; pappus gray, dense; five (sometimes more) of its bristles longer, fragile, barbed; rest long-plumose. Flowering April to May.

Sands, clayey soils, gravels.—*Soviet Central Asia*: Kara-Kum, Amu-Darya, Aralo-Caspian, Balkhash Region, Syr-Darya. *General distribution*:

Iran, ?Afghanistan, ?Indo-Himalayas. Described from Kyzyl-Kum. Type in Paris; isotype in Leningrad.

Note. *E. ammophila* (Bge.) Clarke was described from Yan-Darya; type in Paris.

- 114 3. ***E. hemilasia*** (Bge.) Clarke, Comp. Ind. (1876) 279; Kuntze in Tr. Peterb. Bot. Sada X, 1 (1887) 202, p. p. (incl. var. *multicostata* Kuntze and f. *typica* Kuntze); Kipsch. Fragm. Monogr. *Scorzonera* II (1939) 31; Lipsch. in Fl. Turkm. VII, 311; Kovalevskaja in Fl. Uzb. VI, 446; Aliev in Fl. Azerb. VIII, 530.—*Scorzonera hemilasia* Bge. Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As., i. e. Lehmann reliq. bot. etc. (1851) 201 (seorsum impressum) and Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 377; Boiss. Fl. or. III, 781.—*Epilasia hemilasia* (Bge.) Grossh. in Bot. Sborn. Azerb. GNII I (1932) 56; Grossh. Fl. Kavk. IV (1934) 242.—*Scorzonera cenopleura* Bge. op. cit. (1851) 202 and op. cit. (1854) 378; Boiss. Fl. or. III, 782.—*Epilasia cenopleura* (Bge.) Clarke op. cit. (1876) 279.—*E. hemilasia* var. (vel. monstrum) *cenopleura* Lipsch. op. cit. (1939) 33.—*E. cenopleura* (Bge.) Soják in Nov. bot. Horti Bot. Univ. Prag. (1962) 49.—*Scorzonera intermedia* Bge. op. cit. (1854) 377–378.—*Epilasia hemilasia* var. *intermedia* (Bge.) Boiss. Fl. or. III (1875) 782; Lipsch. op. cit. (1939) 33.—*Epilasia intermedia* (Bge.) Clarke op. cit. (1876) 279.—*E. intermedia* (Bge.) Soják op. cit. (1962) 49.—*Epilasia bungeana* Clarke, op. cit. (1876) 279, p. p.—*Scorzonera nana* Boiss. and Buhse in Nouv. Mém. Soc. Nat. Mosc. XII (1860) 138; Boiss. Fl. or. III, 782.—*Epilasia hemilasia* var. *nana* (Boiss. and Buhse) Kuntze, op. cit. (1887) 202, in adnot.; Lipsch. op. cit. (1939) 33.—*Epilasia nana* (Boiss. and Buhse) Grossh. in Bot. Sborn. Azerb. GNII I (1932) 56; Grossh. Fl. Kavk. IV (1934) 242.—**lc.**: Lipsch. op. cit. (1939) Plate 1, Fig. 1–2 (Type *E. cenopleura*); Plate 2, Fig. 3–4 (Type *E. nana*).

Annual. Plant sometimes more or less soft floccose, sometimes—less often—almost glabrous. Stems solitary or more frequently several (three to five), highly variable in height, (5)10–30(50) cm high, erect or ascending (sometimes prostrate), hollow (especially in lower part), sulcate, simple or often branched, leafy. Leaves variable in shape, finely toothed under hand lens, scabrous, with somewhat prominent veins; basal leaves linear-lanceolate or oblong-ovate, narrowed into petiole; cauline leaves often less numerous (and then stems with rather long internodes), lanceolate or linear-lanceolate, lower leaves with fairly long petioles, upper leaves sessile. Capitula usually numerous, very rarely solitary, ovoid-cylindrical, up to 1.5 cm long at fruiting. Outer involucre bracts leafy, unequal, with broadened lower part, acuminate, with more or less divergent tips; all involucre bracts more or less pubescent or glabrous, sometimes much longer than capitulum, sometimes almost as long; inner

involucral bracts five, coriaceous, slightly membranous along margin, obtuse, almost glabrous or arachnoid - pubescent. Outer ligulate florets slightly exerted from capitulum, light yellow (cream-colored), inner smaller. Achenes slightly broadened at base into hollow stalks, with many whitish hard ribs, covered with retrorse making them highly
 115 scabrous; callous ring in middle of achene, very rarely slightly higher; upper half of achene densely covered with woolly hairs, continuing into pappus; shining after removal of wool, dark brown; visible lower half of achene 3–4 mm long; pappus dense, gray; five (sometimes more) of its bristles barbed above, fragile, others long-plumose. Flowering April to May.

Sands, clays, weedy places.—*Caucasus*: Southern Transcaucasia (Nakhichevan—var. *nana* (Boiss. and Buhse) Kuntze); *Soviet Central Asia*: Kara-Kum, mountainous Turkmenia, Amu-Darya, Syr-Darya, Aralo-Caspian, Balkhash Region, Pamiro-Alai. *General distribution*: Iran, ?Afghanistan, China (Dzhungaria). Described from Soviet Central Asia. Type in Leningrad.

Note. A highly polymorphic species varying in stem height, shape and size of leaves. Dwarf plants 4–6 cm high, occur—this is var. *nana* (Boiss. and Buhse) Kuntze. Described as *Scorzonera nana* from the Caucasus; type in Leningrad. Sometimes very tall forms are found, reaching 50 cm in height with spreading stems and branches and relatively large capitula (f. *vegeta* Sint.). The pubescence of the stems and leaves is also quite polymorphic (if glabrous, then it is var. *subglabra* Winkl.). The sculpturing of the achene is variable (number of ribs and presence or absence of spinules on them); when the ribs are smooth, flat and slightly hollow, it is var. *cenopleura* (Bge.) Lipsch. The latter was described by Bunge from Kyzyl-Kum as a separate species—*Scorzonera cenopleura* Bge. Type in Leningrad.—The type of *S. intermedia* Bge.—a species described from Soviet Central Asia (between Agatma and Karagata)—is preserved in Paris.

GENUS 1637. *Tragopogon* L.^{1, 2}

L. Sp. pl. (1753) 789.

Capitula solitary, terminal on main stem and branches, many-flowered, large or fairly large, 1.5–9 cm long, considerably enlarged at fruiting; peduncles weakly or strongly thickened below capitula or not. Involucre one-rowed, of almost similar contiguous or distant bracts;

¹Treatment by A.G. Borisova.

²From the Greek words *tragos*—goat; and *pogon*—beard.

involucral bracts 5–14(16), linear or linear-lanceolate, sometimes with white border, sometimes uncinatate at fruiting, usually glabrous, sometimes arachnoid pubescent. Receptacle glabrous, alveolate, without scales. All florets ligulate, five-toothed, tubular in lower part, bisexual, yellow, lemon-yellow to orange or lilac, pink to purple or dark violet, shorter, as long or exceeding involucre. Stamens syngenesious; stigma bifid. Achenes sessile, attenuate, fusiform, linear-terete or oblong-terete, angular, with acute or obtuse ribs, sulcate, shallow or deeply furrowed, 5-, 10-angled, ribs usually covered with obtuse or acute scales and tubercles, sometimes smooth or almost so; achenes narrowed above into somewhat long, short or indistinctly developed beak, as long as, shorter or longer than body of achene, less often without beak; beak sometimes clavate or with an annulus at pappus base; pappus (tuft), wholly deciduous, of one row of plumose, unequal bristles, basally connate into ring as if forming a funnel; pappus bristles almost entirely covered with fine plumose, intertwined hair, some (5–10) bristles longer and not plumose in upper part. Biennial and perennial plants with milky sap. Root cordlike, long, straight, cylindrical, vertical, often sparingly branched with slender roots, sometimes tuberous; perennial species with branched rhizome, caespitose; root collar glabrous or covered with remnants of previous year's leaves or their fibers. Stem (10)25–130 cm high, simple or branched, erect, leafy, sulcate, glabrous or arachnoid, or covered with arachnoid-tomentose, floccose pubescence, often crowded on some plant parts at late stages of development: in leaf axils, below capitula, near stem base, etc. Setose pubescence always absent. Leaves alternate, simple, entire, sometimes with undulate or membranous margin, sessile, usually long, linear to lanceolate, sometimes oblong to oblong-ovate, usually acuminate, sometimes almost filiform, parallel-veined, with more or less broadened, often semiamplexicaul base, sometimes involute; middle and upper cauline leaves shorter than basal; lower leaves usually withering subsequently; sometimes leaves exceeding inflorescence.

Several investigators (Poddubnaya-Arnoldi, Araratyan, Marion Ownbey) have studied the chromosomes of the genus *Tragopogon*. The basic number $2n = 12$ has been reported for the species *T. dubius*, *T. pratensis*, *T. orientalis*, *T. brevirostris*, *T. reticulatus*, *T. longirostris*, *T. marginifolius* and *T. porrifolius*. The diploid number $2n = 24$ has been reported for *T. mirus* (*T. dubius* \times *T. porrifolius*) and *T. miscellus* (*T. dubius* \times *T. pratensis*), amphidiploid species obtained through natural hybridization in the USA (Marion Ownbey, 1950, 1953, 1954). These authors have reported differences in the chromosomal structure in different species with the same chromosome number.

Type of genus: *Tragopogon pratensis* L.

The largest number of species of this genus is distributed in the Mediterranean Region; a fairly large number of species grows in Soviet Central Asia and the Caucasus. All *Tragopogon* species are endemic to the Old World, Europe and Asia. They were introduced into America. The genus comprises about 150 species.

- 117 **Economic Importance.** The stem, leaves and roots of some species (e.g., *T. pratensis*, *T. dubius*, etc.) are edible and suitable for making salad. *T. porrifolius* L. is cultivated in western Europe; its roots are used as a vegetable. Many of the species are used as food in the Caucasus and Soviet Central Asia. The roots can be used as a substitute for coffee. They contain a lot of inulin.

Some *Tragopogon* species are melliferous, medicinal or fodder plants.

Identification of the species is extremely difficult, as florets (for corolla color) and mature achenes are essential for precise identification.

For the construction of the key and the preparation of the descriptions of the species, mainly the outer achenes and not the inner were considered.

1. Florets yellow; peduncles below capitula strongly thickened; capitula large, 3.5–9 cm long 2.
- + Florets yellow or pale yellow, dry florets sometimes lilac or reddish; peduncles weakly or strongly thickened or not thickened, but then florets violet or purple 8.
2. Florets 3.5–6.5 cm long; achenes with pappus 3.5–5 cm, with thick, sulcate beak about 3 mm long, pappus longer than achene, 2.3–2.6 cm long, with hairy annulus at base (on sands of Soviet Central Asia and western Siberia); Section 12. *Dubjanskya* Boriss. 60. **T. sabulosus** Krasch. and S. Nikit.
- + Achenes with slender, long beaks, slightly shorter, as long as, or exceeding body of achene; pappus shorter than body of achene or almost as long 3.
3. Achenes weakly sulcate, smooth, gradually narrowed into long and slender beak as long as or slightly shorter than body of achene; involucre bracts 6–8 or 8–12(16) (European part, Soviet Central Asia); Section 1. *Majores* (Artemcz.) Kuthath 4.
- + Achenes deeply sulcate, with acute, prominent, rugose ribs, abruptly narrowed into long and slender, curved, smooth beak, about 2 cm long, two times as long as body of achene; pappus about 2.5 cm long; involucre bracts eight, exceeding florets and achenes (Caucasus); Section 2. *Kemularia* Boriss 6. **T. kemulariae** Kuthath.
4. Achenes with pappus 6–8 cm long, smooth or very deeply rugose, obtusely five-angled, mostly whitish, with smooth slender beak

without clavate thickening at apex; pappus 3–3.5 cm long, almost as long as achene, excluding pappus; cauline leaves usually up to 4–6 cm wide, sometimes much narrower, oblong-lanceolate to lanceolate; capitula 6.5–9 cm long; involucre bracts eight(nine); plants robust, 40–100 cm high (Pamiro-Alai)

..... 3. **T. paradoxus** S. Nikit.

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+ Achenes with pappus 4.8–5.5 cm long, weakly or more or less strongly rugose, sulcate and ribbed 5.

5. Beak of achenes clavate, very thin, bent; achenes with acute ribs; pappus two-thirds as long as achene including beak; involucre bracts or equaling exceeding achene 7.

+ Beak of achenes straight, not or weakly clavate; achenes weakly squamose-tuberculate and sulcate; pappus more or less as long as achene; involucre bracts six to eight, usually shorter than achenes. 6.

6. Achenes with pappus about 5.5 cm long; beak slender, 1.3–1.7 cm long; pappus about 2.5 cm long, whitish; involucre bracts (seven) eight, much shorter than achenes; capitula 6–7 cm long (Pamiro-Alai) 4. **T. serawschanicus** S. Nikit.

+ Achenes with pappus about 4.8 cm long; beak somewhat thick, about 1.1 cm long, almost smooth; pappus about 2.3 cm long, yellowish; involucre six to eight, as long or slightly shorter than achenes, much longer than florets; capitula cylindrical, 3.5–5 cm long (Balkhash Region, Dzhungaria-Tarbagatai, Tien Shan). 5. **T. pseudomajor** S. Nikit.

7. Achenes with pappus 3.2–5.5 cm long; beak 0.8–2 cm long; body of achenes weakly sulcate, tuberculate from acute imbricate scales, continued on lower part of beak; pappus dirty white or yellowish, 1.2–2.5 cm long; involucre bracts (8) 10–12(16), considerably longer than florets, shorter or more or less as long as achenes; capitula 5–6(7) cm long (European part) 1. **T. dubius** Scop.

+ Achenes with pappus 5.5–7.5 cm long; beak 1.7–2.5 cm long, thin, finely sulcate, smooth; body of achene indistinctly ribbed, weakly rugose from small scales or almost smooth; pappus yellowish-golden-yellow, lustrous, 2.5–3 cm long; involucre bracts considerably longer than florets and slightly longer or, less often, almost as long as achenes; capitula 5.5–8.5 cm long at fruiting (Soviet Central Asia) 2. **T. capitatus** S. Nikit.

8(1) Roots cylindrical, swollen, tuberous to some depth; florets pale- or bright-yellow, dry florets lilac, with brownish veins (Caucasus). Section 7. *Tuberosi* Boriss. 9.

+ Roots cylindrical but not tuberous; florets yellow, violet, pink, or purple 10.

9. Florets pale yellow; involuclral bracts shorter than florets; capitula small and medium; peduncles not thickened; plants short, 5–15(20) cm high, floccose, mainly in lower part..... 27. **T. pusillus** M.B.
- + Florets bright yellow, sometimes with violet veins; involuclral bracts as long as or shorter than ligulate florets; capitula large, at fruiting 4–5 cm long; peduncles thickened below capitula; plants 20–40(45) cm high..... 26. **T. tuberosus** C. Koch
- 119 10. Pappus almost three times as long as achene with beak; beak long, one and one-half to two times as long as body of achene; involuclral bracts eight; florets pale yellow (Caucasus); Section 4. *Macropogon* (Kuthath.) Boriss 10. **T. macropogon** C.A.M.
- + Pappus shorter, as long as or slightly longer than body of achene; combination of characters different 11.
11. Peduncles strongly thickened below capitula, fistular; leaves linear-lanceolate, upward spreading; involuclral bracts five to eight, as long as or longer than florets; achenes 5–8 cm long, rugose-tuberculate with thick straight beak, almost as long as or shorter than achenes. Mainly cultivated in western Europe, sometimes wild; Section 17. *Hebecarpus* Boriss 79. **T. porrifolius** L.
- + Peduncles not thickened or weakly or strongly thickened, but then combination of characters different 12.
- 12 Florets violet, purple or pink; beak somewhat thick, straight, as long as body of achene or shorter..... 13.
- + Florets yellow, less often violet or purple, but then achenes with long slender beak 15.
- 13 Pappus violet or reddish; involuclral bracts six to eight; one and one-half to two times as long as florets; peduncles clavate, short; capitula large, 4–7 cm long (Caucasus); Section 15. *Coloropappus* Boriss 14.
- + Pappus whitish or yellowish, less often faintly colored in upper part; involuclral bracts 8–10, shorter or almost as long as florets; plants short, 5–40 cm high usually with leaves crowded in lower part of plant; peduncles not or slightly thickened, less often clavately thickened; capitula medium to large; plants mostly of Soviet Central Asia; one species in the Caucasus and one in the southeast of the European part; Section 16. *Rubriflori* Boiss..... 69.
14. Capitula 4–5.5 cm long at fruiting; achenes 4–5 cm long with pappus; pappus one and one-half to two times as long as achene, purple or reddish in upper part; body of achenes with five prominent squamose-tuberculate ribs, abruptly terminated into thick smooth beak, one and one-half times as long as achene; plants

- 40–60 cm high (Caucasus)..... 67. **T. nachitschevanicus** Kuthath.
- + Capitula about 7 cm long at fruiting; achenes 4-5 cm long with pappus; pappus dirty violet, as long as or slightly longer than achenes; body of achene deeply sulcate, two times as long as somewhat thickened beak; plants 7–30(60) cm high (Caucasus).. 120
- 66. **T. coloratus** C.A.M.
- 15 Florets dark violet or reddish; peduncles weakly thickened below capitula; capitula 6–8 cm long at fruiting; achenes large, with long slender beak; pappus shorter than achene, whitish or yellowish; involucre bracts 7–8(12), almost two times as long as florets; large, sparingly branched, 30–120 cm high plants (Soviet Central Asia, Caucasus); Section 5. *Krascheninnikovia* Boriss
- 11. **T. krascheninnikovii** S. Nikit.
- + Florets yellow or reddish-violet, but combination of characters different..... 16.
16. Achenes gradually narrowed into slender long beak as long as or slightly shorter than body of achene; florets yellow or reddish-violet 17.
- + Achenes abruptly narrowed into beak, or achene without beak, or beak indistinct 20.
17. Involucre bracts five to eight, exceeding florets; capitula narrow-cylindrical, with few seeds, about 5 cm long; perennial plants with narrowly-linear leaves (Soviet Central Asia, Caucasus); Section 3. *Angustissimi* Kuthath..... 18.
- + Involucre bracts 6–11, usually 7–8, exceeding florets or shorter; capitula usually medium-sized, on long straight peduncles; perennial or biennial plants; Section 6. *Tragopogon*..... 36.
18. Florets yellow; involucre bracts five to seven, two times as long as florets; achenes 3.5–4 cm long 19.
- + Florets reddish-violet or pink; involucre bracts eight, slightly exceeding florets; achenes with about 4.2 cm long pappus and about 6 mm long beak, clavately thickened below pappus; plants glaucescent-green 7. **T. sosnovskyi** Kuthath.
19. Involucre bracts five; achenes with finely sulcate slender beak, 4–7(9) mm long, clavately thickened at apex and sparsely pubescent but without hairy annulus at base of pappus; pappus about 2 cm long, sometimes brownish; plants glabrous, arachnoid-tomentose in lower part when young, strongly branched and densely leafy; leaves linear to filiform (Soviet Central Asia)
- 9. **T. vvedenskyi** M. Pop.
- + Involucre bracts five to seven; achenes with about 9 mm-long slender beak without thickening at apex and without hairy annulus; plant loosely floccose (Caucasus) 8. **T. segetus** Kuthath.

- 20(16) Achenes with five prominent winged ribs, abruptly narrowed into beak; pappus longer than achene; capitula large; involucre bracts 8, less often 10–12, sometimes 5; biennial plants (Caucasus); Section 8. *Profundisulcati* Kuthath..... 26.
- + Achenes without winged ribs, without or with indistinct beak; capitula medium to large, 2–5 cm long; involucre bracts 6–8 or 8–12, sometimes five, but then achenes without beak 21.
21. Achenes somewhat thick, acutely tuberculate and sulcate, without beak; pappus longer than achene; involucre bracts five (less often six), shorter than florets and achenes; capitula numerous, small to medium, 2–3.5 cm long; florets pale yellow, dry florets pale lilac. Plants perennial or biennial, branched from base (Kopetdag Range); Section 13. *Dasypogon* Boriss 61. **T. kopetdaghensis** Boriss.
- + Achenes somewhat thick, smooth, without or with short thick beak, or achenes slender and smooth or rugose, gradually narrowed into indistinct beak; pappus shorter than or almost as long as achenes; capitula small to large; involucre bracts 6–12; florets yellow or pale yellow 22.
22. Capitula 2–4.5 cm long, numerous, on short usually bent peduncles, in paniculate inflorescence; achenes somewhat thick, without or with short thick beak, smooth; biennial plants (sands of Soviet Central Asia and lower reaches of the Volga and Don); Section 14. *Nikitinia* Boriss 23.
- + Capitula small and medium to large, on erect, mostly long peduncles; achenes smooth or shallow sulcate, gradually narrowed into indistinct, slender or somewhat thick beak; perennial and biennial plants 50.
23. Leaves lanceolate, basally broad; plants large; capitula numerous, 2.5–4.5 cm long; achenes thick, 2–3.5 cm long including pappus, smooth, finely sulcate; pappus about 1.5 cm long; plants 40–150 cm high with strong up to 1.5 cm thick stem (sands of the Aral Region)..... 62. **T. dubjanskyi** Krasch. and S. Nikit.
- + Leaves linear; plants flocculose-tomentose, sometimes only near leaf bases; capitula small to medium and large, 1–4 cm long; achenes rugose or with alternating rugose and smooth edges, shallow-sulcate 24.
24. Pappus without hairy annulus at base, about 1 cm long; capitula 1.5–2.5 cm long 25.
- + Pappus with hairy annulus at base, 1.5–1.8 cm long, longer than achenes; achenes somewhat thick, shallow-sulcate, with alternating smooth and rugose edges and hairy annulus at apex; capitula 20–

- 40 mm long; involuclral bracts 7–12; plants glaucous from tomentum (Lower Volga, Lower Don, Aralo-Caspian Region)
..... 64. **T. ruthenicus** (C.A.M.) Bess.
25. Plants up to 1.5 m high, almost glabrous and flocculose-tomentose only in upper part and near leaf base, strongly branched above; involuclral bracts 8–10; cauline leaves about 8 mm wide at base, carinate 63. **T. scoparius** S. Nikit.
- 122 + Plants 10–40 cm high, more or less densely pubescent below capitula, young branches flocculose usually branched from base; involuclral bracts (seven) eight, densely pubescent
..... 65. **T. donetzicus** Artemcz.
- 26(20) Achenes gradually narrowed into beak; basal leaves mostly linear 27.
- + Achenes abruptly narrowed into beak; basal leaves lanceolate and broadly lanceolate 28.
27. Basal and cauline leaves almost similar, linear or broadly linear, up to 1.5 cm wide; upper leaves reduced and broadened, at base up to 2 cm wide, lanceolate, all leaves dark green and lustrous; florets yellow, dry florets with light blue stripes
..... 37. **T. makaschwillii** Kuthath.
- + Basal leaves narrowly linear, folded, long and subulate; florets yellow 35. **T. acanthocarpus** Boiss.
28. Leaves 1.5–4 cm wide 29.
- + Leaves much narrower 30.
29. Involuclral bracts 10–12, wide, lanceolate, long-acuminate, shorter than florets, basally flocculose at flowering; beak shorter than body of achene; pappus whitish 34. **T. latifolius** Boiss.
- + Involuclral bracts eight, narrowly lanceolate, white-membranous along margin; beak as long as body of achene, clavate; body of achene shallow-sulcate, white-scaly along ribs, with five obtuse edges; pappus yellowish-golden, shorter than achene including beak 36. **T. idae** Kuthath.
30. Involuclral bracts 5 or 10–12 34.
- + Involuclral bracts eight 31.
31. Peripheral achenes large, 4–6 cm long, with five deep furrows and five prominent winged ribs 32.
- + Peripheral achenes smaller 33.
32. Basal leaves long, almost half as long as plant, linear or broadly linear; plant glabrous; beak slender, more or less as long as achene, with hairy annulus at apex; pappus shorter than achene with beak; involuclral bracts as long as or slightly shorter than achene
..... 29. **T. ketzkhovellii** Kuthath.
- + Basal leaves 8–10 cm long, up to 3 cm wide, oblong-lanceolate;

- beak somewhat thick, as long as or longer than body of achene 30. **T. plantagineus** Boiss. and Huet
- 123 33. Outer achenes with five deep furrows, acutely tuberculate-scaly along ribs, abruptly narrowed into beak longer than its body; involucre bracts as long as or longer than achenes; florets pale yellow (Southwestern Transcaucasia) 28. **T. meskheticus** Kuthath.
- + Outer achenes with 10 ribs, slender, sulcate, white scaly, bent, convex near midpoint, abruptly narrowed into beak as long as or slightly longer than its body; capitula large; involucre bracts eight, shorter than achene including pappus . 33. **T. karjagini** Kuthath.
- 34(30) Involucre bracts five; capitula large, about 4.5 cm long; marginal achenes with five deep furrows and distinct ribs; beak shorter than body of achene, thickened at apex; pappus almost as long as achene 38. **T. armeniacus** Kuthath.
- + Involucre bracts 10–12 35.
35. Involucre bracts 10–12; basal leaves up to 23 cm long, 7–8 mm wide. Cauline leaves shorter, with prominent veins; upper leaves short, up to 2–2.5 cm wide at base 31. **T. buphtalmoides** Boiss.
- + Involucre bracts 12; basal leaves linear, shorter, not exceeding stem; cauline leaves numerous, crowded, reduced, lanceolate 32. **T. tasch-kala** Kuthath.
- 36(17) Florets yellow, pale yellow or orange, sometimes dry florets pale lilac or whitish; pappus longer or shorter than achene 41.
- + Florets violet, pink-violet, or pink; pappus shorter or as long as achenes with beak, sometimes even longer 37.
37. Involucre bracts 8–12, exceeding florets; peduncles slightly thickened or not below capitula; biennial plants of Western Siberia and the Volga Region 40.
- + Involucre bracts seven or eight, almost as long as florets; peduncles not thickened; perennial plants of Soviet Central Asia 38.
38. Plants with downy white tomentum on stem, leaves, and involucre bracts; root collar with fibrous remnants of old leaves; pappus more or less 2.5 cm long, much longer than achene, brownish; beak somewhat slender, weakly rugose in lower part, pubescent above 21. **T. tomentosulus** Boriss.
- + Plants glabrous; pappus shorter or almost as long as achene with beak 39.
39. Plants 10–25 cm high, caespitose; florets pink-violet; achenes with pappus about 2.8 cm long; beak about 6 mm long, shorter than body of achene; pappus about 1.3 cm long (Tien Shan, Dzhungarian Alatau) 23. **T. subalpinus** S. Nikit.
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- + Plants 25–30 cm high; florets pink; achenes with pappus about 4.8 cm long; beak about 1.1 cm long, as long as body of achene; pappus about 2.3 cm long (Balkhash)..... 20. **T. karelinii** S. Nikit.
- 40. Florets dark red or purple, shorter than involucre; peduncles slightly thickened below capitula; plants 45–110 cm high; achenes with pappus about 4 cm long, smooth, terete, with slender smooth beak as long as, shorter, or slightly longer than body of achene; pappus about 1.7 cm long (Western Siberia) 24. **T. sibiricus** Ganeschin
- + Florets pink-violet or purple, aggregated in narrow capitula, 2.5–3.5(5.5) cm long; peduncles not or slightly thickened, glabrous, slender; leaves narrowly linear to filiform; achenes straight, five-angled, rugose in lower part, with slender beak longer than body of achene; pappus shorter than achene including beak, dirty brown (on chalk near Vol'sk on Volga) 25. **T. cretaceus** S. Nikit.
- 41(36) Involucral bracts much shorter, two-thirds as long as outer florets; florets bright, golden-yellow; achenes including pappus about 3.9 cm long; body of achene gradually narrowed into about 9 mm-long beak; pappus much shorter than achene with beak (European part) 12. **T. orientalis** L.
- + Involucral bracts as long as florets or longer, less often slightly shorter. Florets pale yellow, yellow or orange; dry florets whitish or pale lilac 42.
- 42. Florets orange; body of achene obtusely sulcate with alternating rugose and smooth edges, abruptly narrowed into 5–7 mm-long beak; involucral bracts divergent, as long as achenes and shorter than florets (Altai) 19. **T. altaicus** S. Nikit. and Schischk.
- + Florets light yellow or yellow, sometimes dry florets whitish or pale lilac 43.
- 43. Plants glabrous, green; involucral bracts almost as long as florets or longer 45.
- + Plants whitish from flocculose tomentum, sometimes pubescent only in early developmental stage. 44.
- 44. Plants perennial, short, 10–20(25) cm high, caespitose, young branches flocculose-tomentose; involucral bracts six (less often seven or eight); florets yellow, dry florets pale lilac (Pamir, Alai Range) 22. **T. gracilis** D. Don.
- + Plants biennial whitish from flocculose-tomentum; involucral bracts 7–11; florets pale yellow, whitish on drying (Belorussia, sands) .. 14. **T. bjelorussicus** Artemcz.
- 45. Florets light yellow above, dirty violet below; capitula 15–20 mm long (Dauria) 15. **T. trachycarpus** S. Nikit.

- + Florets yellow or light yellow; capitula 25–50 mm long (European part, Soviet Central Asia)..... 46.
- 46. Plants perennial; root collar covered with fibers; peripheral achenes smooth; beak as long as body of achene (Lithuania)..... 40. **T. gorskianus** Rchb.
- + Plants biennial; root collar covered with fibers or old leaves . 47.
- 47. Florets light yellow; root collar covered with fibers; involucre bracts 8–10; almost as long as florets (European part)..... 13. **T. pratensis** L.
- + Florets yellow; root collar with or without remnants of old leaves; involucre bracts seven or eight(nine), exceeding florets; montane plants 48.
- 48. Peduncles at fruiting more or less thickened; achenes with pappus 4–4.5 cm long, with 1–1.2 cm long beak, and hairy annulus at apex below pappus..... 49.
- + Peduncles not thickened at fruiting; achenes with pappus 3.2–3.6 cm long, with about 0.6 cm-long beak, and without hairy annulus at apex (north of Trans-Ili Alatau, Dzhungarian Alatau, Tarbagatai) 16. **T. songoricus** S. Nikit.
- 49. Plants (25)50–100 cm high, stem simple or branched, usually in upper part, sparsely leafy; involucre bracts seven or eight(nine), one and one-half times as long as florets; peduncles at fruiting slightly thickened; florets yellow; achenes about 4 cm long, with about 1 cm long beak (Tien Shan, Pamiro-Alai, at 1,000–2,600 m) 17. **T. turkestanicus** S. Nikit.
- + Plants 15–35 cm high, branched from base, densely leafy in lower part; involucre bracts eight(nine), slightly shorter or as long as florets; peduncles more or less thickened at fruiting; florets pale yellow, pale violet when dry; achenes about 4.3 cm long, with about 1.2 cm-long beak (at 3,200–4,000 m in the Gorno [Mountainous]-Badakhshan Autonomous Region) 18. **T. badachschanicus** Boriss.
- 50(22) Capitula small to medium, up to 3 cm long; florets yellow and pale yellow; involucre bracts six to eight or 8–12, shorter than florets and achenes; achenes small, slender, smooth or rugose and tuberculate, narrowed into short, indistinct, 1.5–3 mm-long beak 51.
- + Capitula medium to large, 3.5–5 cm long; florets large, orange, yellow, or pale yellow; involucre bracts eight, considerably shorter than florets and as long as achenes; achenes large, gradually narrowed into somewhat thickened, straight, indistinct beak shorter than the body (Caucasus); Section 11. *Sosnovskya* Boriss 52.
- 51. Achenes slender, tapered and smooth or weakly scabrous, narrowed

- toward apex into indistinct, 1.5–3 mm-long beak; pappus shorter than achenes; involucre bracts 8–12; peduncles slightly longer than leaves; plants perennial, flocculose-tomentose, branched from base and often caespitose, less often plants biennial (sands, European part); Section 9. *Bessera* Boriss 55.
- + Achenes shallow-sulcate, tuberculate, distinctly narrowed into short, sometimes indistinct, beak; pappus as long as achene; involucre bracts six to eight; peduncles longer than leaves; plants mostly perennial, less often biennial, not caespitose (European part, Caucasus, Turkmenia); Section 10. *Brevirostres* Kuthath 57.
- 52(50) Achenes white, with indistinct, somewhat thickened beak shorter than the body; pappus longer than achene, about 2.5 cm, dirty golden; florets yellow; cauline leaves with white border (Caucasus) 56. **T. marginatus** Boiss. and Huet
- + Achenes gradually narrowed into 5–8(10) mm long beak; pappus almost as long as achene or shorter, white or grayish 53.
53. Florets bright yellow, considerably longer than involucre; plants 20–65 cm high; basal leaves linear; cauline leaves broadened from base, oblong, long-acuminate; usually all leaves flocculose, sinuate and drooping (Caucasus) 57. **T. reticulatus** Boiss. and Huet
- + Florets pale yellow, sometimes dry florets pale lilac 54.
- 54 Florets pale yellow; involucre bracts eight, lanceolate, shorter than achenes, at fruiting deflexed and involute; body of achene indistinctly ribbed in upper part, finely and indistinctly scaly along ribs; beak about 0.5 cm long (Caucasus) 58. **T. charadzeae** Kuthath.
- + Florets pale lilac; involucre bracts 8–10, much shorter than florets and achenes, lanceolate-linear, finely acuminate; body of achene sulcate, upper part squamose with acute, upward directed scales; beak 0.8–1.0 cm long (mountainous Turkmenia, Iran) 59. **T. maturatus** Boriss.
- 55(51) Plants perennial, 5–10 cm high, with strong shortly branched stem, caespitose, with numerous fertile and vegetative branches; leaves narrowly linear to filiform, numerous; capitula rather small; florets light yellow; achenes almost smooth; with about 3 mm-long, indistinct beak (Lithuania) 39. **T. lithuanicus** (DC). Boriss.
- 127 + Plants biennial, 15–75 cm high, capitula 2.5–3.5 cm long; florets yellow or light yellow; achenes 2.5–3.5 cm long, slender, smooth or finely scarious-rugose along ribs, gradually and insignificantly narrowed toward apex; beak not developed 56.
56. Florets yellow; involucre bracts (seven) eight, pubescent bracts alternating with less pubescent ones, shorter than florets; pappus 9–10 mm long; achenes slender, five-angled, about 2.5 cm long,

- finely scarious-rugose (sands along the middle reaches of the Don and Volga rivers) 41. **T. tanaiticus** Artemcz.
- + Florets pale yellow; involucre bracts 8–12, with long cusp; pappus about 1.5 cm long, almost as long as achene; achenes 2.5–3.5 cm long, slender, almost smooth, in upper part narrowed over 2–3 mm (sands of the Baltic Region) 42. **T. heterospermus** Schweigg.
- 57(51) Plants perennial; beak of achenes much shorter than body, or achenes without beak; florets yellow or orange-yellow, dry florets sometimes with violet veins; capitula small to medium, up to 3 cm long 58.
- + Plants biennial; beak of achenes undeveloped or inconspicuous; florets yellow; capitula small 62.
58. Florets orange-yellow, sometimes with purple stripes below ... 59.
- + Florets yellow 60.
59. Stems slender, numerous; plants glabrous; involucre bracts seven; achenes with pappus about 2 cm long; florets two times as long as involucre; orange-yellow (Western Caucasus) 51. **T. colchicus** Alb.
- + Stems few, two or three; involucre bracts 8–10, flocculose at base; achenes with pappus about 2.4 cm long; florets slightly exceeding involucre, orange-yellow, with purple stripes below (South Osetia) 50. **T. filifolius** Rehm.
60. Root collar densely covered with fibers; beak slightly shorter or almost as long as body of achene, slender, distinct; florets pale yellow, whitish when dry; plants usually tall, 20–90 cm high, densely leafy; leaves 4–8 mm wide, linear to lanceolate 47. **T. graminifolius** DC.
- + Root collar weakly covered with fibers or not; beak one-third as long as achenes; florets yellow, violet-lilac or pale yellow when dry; leaves narrowly linear, 1.5–4 mm wide (Caucasus) 61.
61. Florets yellow, violet-lilac when dry; plants glabrous, grayish-green, sometimes arachnoid, flocculose up to flowering, 30–60(90) cm high; involucre bracts eight, lanceolate-linear; peripheral achenes 2.5–2.8 cm long, whitish, shallow-sulcate, tuberculate-squamose, gradually narrowed into smooth, glabrous, 3–6 mm-long beak; pappus longer than achene 48. **T. brevirostris** DC.
- + Florets pale yellow; plants sparsely flocculose, 35–50 cm high, involucre bracts six to eight, lanceolate; peripheral achenes about 2.5 cm long, squamose-tuberculate, globose, and obtusely angular with two rows of sparse, indistinct scales; body of achene distinctly narrowed into about 0.5 mm-long beak; pappus shorter than achene 49. **T. serotinus** Sosn.

- 62(57) Achenes with or without indistinct beak..... 63.
 + Achenes with distinct short beak 66.
63. Pappus 0.5–0.7 cm long, shorter than achene; achenes without or with indistinct beak..... 64.
 + Pappus about 1.5 cm long, as long as achene or longer; achenes without beak 65.
64. Achenes with 1.6–1.9 cm long pappus, without beak, smooth, slender; upper leaves strongly reduced, ovate-cordate at base (on sands in the lower reaches of the Dnieper and Bug rivers)
 55. **T. borysthenticus** Artemcz.
 + Achenes with pappus 2–2.3 cm long, narrowed into indistinct, about 3 mm-long beak; upper and cauline leaves acuminate (sands and sandy soils in the middle reaches of the Dnieper and Don rivers) 53. **T. ucrainicus** Artemcz.
65. Achenes with pappus about 2.3 cm long, curved, sulcate, distinctly narrowed toward apex; pappus about 1.3 cm; capitula rather small; plants arachnoid-tomentose, with narrow-linear leaves, usually convolute..... 52. **T. stepposus** (S. Nikit.) Stankov
 + Achenes with pappus about 3.2 cm long, straight, shallow-sulcate, with two rows of scales, elsewhere smooth, gradually narrowed toward apex; plants grayish from dense flocculose pubescence ...
 54. **T. daghestanicus** (Artemcz.) Kuthath.
- 66(62) Basal leaves 5–6 cm wide (Crimea)..... 46. **T. elatior** Stev.
 + Basal leaves narrow, linear or linear-lanceolate. 67.
67. Pappus shorter than achene; basal leaves linear, not folded, usually flat; upper and middle cauline leaves broadened at base, finely acuminate, sometimes convolute..... 45. **T. podolicus** Bess.
 + Pappus as long as or longer than achene 68.
68. Plants glabrous or weakly pubescent, sometimes flocculose-tomentose in leaf axils; basal leaves linear, usually folded; involucre bracts (seven) eight, shorter than florets; capitula often solitary, on long, straight, somewhat slender peduncles; achenes with acute scales 43. **T. dasyrrhynchus** Artemcz.
- 129 + Plants glabrous, light green; leaves not exceeding stem, herbaceous, linear or linear-lanceolate, flat; not broadened at base; involucre bracts five to eight, shorter than florets or as long, shorter than achenes; capitula narrow, small, 18–25(30) cm long; achenes finely tuberculate along ribs; sulcate 44. **T. volgensis** S. Nikit.
69. Peduncles strongly clavately thickened below capitula, sulcate; leaves broadly lanceolate, 10–15(20) mm wide; involucre bracts eight, almost as long as florets; achenes about 3.6 cm long, with about 0.8 cm-long beak, without hairy annulus
 77. **T. kultiassovii** M. Pop. ex S. Nikit.

- + Peduncles below capitula not or weakly thickened. 70.
- 70. Pappus two-thirds as long as achene with beak, brownish, densely hairy; leaves with broad rhomboid base; stems slender, erect; achenes with pappus 3.5–3.7 cm long, deeply sulcate, sharply scabrous, abruptly narrowed into straight beak (Balkhash Region, Zaisan Kettle Hole, Dzhungarian Alatau)..... 75. **T. elongatus** S. Nikit.
- + Pappus as long as achene with beak or longer 71.
- 71. Plants tall, glabrous, 40–60 cm high, with narrowly linear to linear-lanceolate leaves; achenes 5–6 cm long, body of achene gradually narrowed into thick, straight, 0.7–1.2 cm-long beak, sulcate in lower part (Alai Range) 73. **T. alaicus** S. Nikit.
- + Plants shorter, 10–40 cm high, often with narrow or wide leaves crowded at base; plants glabrous or young branches flocculose; achenes 4–5 cm long. 72.
- 72. Plants glabrous, short, with short peduncles not thickened or somewhat thickened at fruiting..... 73.
- + Plants flocculose, especially near leaf bases, sometimes hairy only when young, later glabrous; peduncles not thickened; leaves crowded in lower part of stem 77.
- 73. Leaves lanceolate or oblong-lanceolate, up to 1 cm wide; achenes with about 1 cm-long beak, as long as body of achene, with hairy annulus at apex below pappus; pappus longer than achene, 3 cm long; plants 10–25 cm high (Kopetdag). 74. **T. gaudanicus** Boriss.
- + Leaves narrowly linear or lanceolate 74.
- 74. Beak of achenes about 5 mm long, without hairy annulus at apex; pappus 2.5 cm long, as long as achene with beak or longer; achene with distinct sculpture, obtusely short-scaly; leaves on short (10–17 cm high) plants narrowly-linear, folded and straight (Zeravshan Range) 71. **T. conduplicatus** S. Nikit.
- 130 + Beak 1–1.5 cm long, somewhat thick, smooth, with hairy annulus at apex, or without annulus, but then leaves wider; achenes five-angled, sulcate, finely and acutely squamose 75.
- 75. Leaves wide, flat, with many veins, distant, sometimes reduced, lower leaves may be linear; peduncles not or weakly thickened; capitula large, at fruiting 4.5–5.5(6) cm long; involucre bracts shorter or almost as long as florets; beak about 1 cm long; pappus as long as achene with beak 72. **T. montanus** S. Nikit.
- + Leaves linear, not longer than inflorescence; peduncles more or less thickened below capitula. 76.
- 76. Pappus brownish, densely plumose-villous, slightly shorter than

- achene; leaves not longer than inflorescence, linear, sinuate; plants densely leafy (Karatau)..... 76. **T. malicus** S. Nikit.
- + Pappus dirty white or yellowish, almost as long as achene; leaves broadened near base up to 5–12(20) mm, semiamplexicaul, narrowly linear or linear-lanceolate upward, narrowly membranous along margin (sandy deserts of central Kazakhstan) 78. **T. kasachstanicus** S. Nikit.
- 77(72) Beak of peripheral achenes gradually merging with body of achene 78.
- + Beak of peripheral achenes more or less abruptly joined with broader, deeply sulcate, sometimes winged part of achene; leaves 10–20(30) mm wide, with cartilaginous border, undulate; plants 10–40 cm high, densely leafy 70. **T. marginifolius** Pavi.
78. Beak of achenes smooth; achenes weakly scabrous in upper part, more or less smooth below; basal leaves numerous, lanceolate-linear to filiform, flat or convolute (Caucasus)..... 68. **T. collinus** DC.
- + Beak, as also entire achene, sulcate, scabrous; leaves usually linear (Lower Volga, Aralo-Caspian) 69. **T. ruber** S.G. Gmel.

Section 1. Majores (Artemcz.) Kuthath. Kavk. Predst. Tragop. (1957) 37 emend.—Ser. *Majores* Artemcz. in Uch. Zap. Chernov. Univ. I (1948) 88, diagnosis in Russian.—Peduncles below capitula mostly strongly thickened, less often weakly thickened; capitula large or medium, solitary, on long straight peduncles; involucre bracts 8–12 or 6–8, longer than ligulate florets; florets yellow, sometimes whitish or pale lilac on drying; achenes large, body of achene shallow-sulcate, finely rugose or smooth, gradually narrowed into long, slender, smooth beak, often longer than

131 body of achene; pappus usually shorter or almost as long as achene with beak; plants biennial.

Type of section: *T. dubius* Scop.

Series 1. Robusti Kuthath. Kavk. Predst. Tragop. (1957) 38, p. p.—Peduncles thickened below capitula, fistular; capitula large; involucre bracts longer than ligulate florets; florets yellow; beak of achenes long, slender, longer than body of achene.

1. **T. dubius** Scop. Fl. carniol. II (1772) 95; Montgomeri in Rhodora 55 (1953) 659; Kuthath. Kavk. Predst. Tragop. (1957) 38; Fl. Azerb. VIII (1961) 507.—*T. majus* Jacq. Fl. Austr. I (1773) 19, t. 29; M.B. Fl. taur.-cauc. II, 233, and III, 521; DC. Prodr. VII, 112; Ldb. Fl. Ross. II, 784; Boiss. F. or. II, 747; Kryl. Fl. Zap. Sib. XI, 2975; Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II, 55; Grossh. Fl. Kavk. IV (1934) 230, p. p.;

Klokov in Vozn. Rosl. URSS, 591; Kuthath. in Fl. Gruzii VIII, 620; Mikhail. in Fl. BSSR, V, 178; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 2.—*T. desertorum* Lindem. Fl. Cherson. I (1881) 365; Klokov, op. cit. 591.—*T. major* Jacq. var. *vulgare* Schmalh. Fl. II (1896) 146.—*T. livescens* Bess. Enum. pl. Volh. (1822) 30; DC. Prodr. VII, 112; Klokov, op. cit. 590.—*T. intermedius* Bess. op. cit. 83; DC. op. cit. 114, pro syn.—*T. campestris* Bess. Enum. pl. Volh. (1822) 84; DC. op. cit. 114; Ldb. Fl. Ross. II, 784.—*T. major* Jacq. var. *campestris* (Bess.) Schmalh. op. cit.; Grossh. op. cit.—*T. majus* Jacq. β . *stenophyllus* Boiss. l.c.—*T. dubius* Scop. II. *campestris* (Bess.) Hayek. Prodr. Fl. Balk. 2 (1931) 819.—**lc.**: Javorka and Csapody, Iconogr. Fl. Hung. (1929) f. 3991; Hegi, Ill. Fl. VI, 2, fig. 733; Kuthath. op. cit. Plate VI, Fig. 21, Map No. 7.

Biennial. Root vertical, easily pulled; root collar covered with previous year's leaves or not; plants 30–70 cm, sometimes 1.5 m high, with erect, simple or weakly branched, finely ribbed stem, glabrous or sometimes with weak flocculose pubescence at leaf base and below capitula. Lower leaves narrowly linear or lanceolate-linear, numerous, flat, erect, sometimes withering early; middle leaves (6)8–20 cm long, 5–20 mm wide, broadened at base, semiamplexicaul, abruptly narrowed into linear or narrowly lanceolate, sometimes folded lamina; upper leaves shorter, long-attenuate-acuminate, often reduced. Peduncles long, fistular, clavately thickened below capitula, especially at fruiting, 6–10(12) mm thick, sometimes tomentose. Capitula terminal on stem and branches, large, at fruiting 5–6(7) cm long, 2–2.5 cm wide; involucre of 8–12 (less often 16) bracts; involucral bracts linear-lanceolate, long- and finely acuminate, glabrous, much longer than florets, shorter or almost as long as achenes, 4.5–6(7) cm long, 1.5–2 cm wide; florets yellow; achenes with pappus 3.2–5.5 cm long, without pappus 2–3 cm long, without beak 1–1.2 cm long, 1–1.2 mm wide, oblong, slightly curved, grayish, 132 yellowish, or light brown, shallow-sulcate, five-angled, densely squamose, serrate-dentate, gradually narrowed into slender, smooth or weakly sulcate beak below, 0.8–2 cm, almost as long as body of achene, or longer, slightly broadened below pappus and with hairy annulus; pappus whitish, dirty white or yellowish, 1.2–2.5 cm long, with hairs of variable length. $2n = 12$. Flowering May to August; fruiting June to September.

Dry meadows, scrubs, forest edges, as a weed of roadsides, cultivated fields, sandy and clayey desert-steppes, sometimes on sands.—*European Part*: Ladoga-Ilmen, Upper Volga, Volga-Kama, Upper Dnieper, Middle Dnieper, Volga-Don, Trans-Volga, Upper Dniester, Bessarabia, Lower Don, Black Sea Region, Crimea, Lower Volga; *Caucasus*:. Ciscaucasia, Dagestan, Eastern and Southern Transcaucasia, Talysh. *General distribution*: Central Europe, Atlantic Europe, Mediterranean, Balkans-

Asia Minor, Armenia and Kurdistan. Described from western Europe. Type in Italy.

Note. *T. dubius* Scop. is a polymorphic, widely distributed species. Besides the typical form, var. *campestre* (Bess.) Schmalh., with an involucre of eight bracts, less thickened peduncles and narrower and smaller capitula, is also found; the narrow-leaved form, var. *stenophyllus* Boiss., has been reported from Crimea.

2. ***T. capitatus*** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12 (1937) 257; Boris. in Fl. Turkm. VII, 293; Kovalevskaja in Fl. Uzb. VI, 434.—*T. majus* auct. fl. turkest. ex parte, non Jacq.—*T. macrocephalum* S. Nikit. in Zakir. Fl. i. Rast. Zeravsh. 2 (1962) 419, nomen.

Biennial. Root vertical, robust; root collar covered with numerous basal leaves. Plant large (30–100 cm high), glabrous, usually branched below middle. Stem thick, robust, sulcate. Cauline leaves linear-lanceolate, basally broadened to 10–20 mm, semiaplexicaul, abruptly narrowed upward; lower leaves linear. Peduncles below capitula clavate to 7–15 mm, fistular, long, exceeding inflorescence. Capitula large, with fruits 5.5–8.5 cm long, 1.7–3 cm wide. Involucre of 10–12 (less often 8–14) bracts, far exceeding florets and slightly longer or very rarely almost as long as achenes; involucre bracts linear-lanceolate, long- and finely acuminate. Florets yellow; outer achenes 5.5–7.5 cm long, without pappus 2.8–3.8 cm long, about 1.5 mm wide, slightly curved, indistinctly five-angled, almost smooth, with inconspicuous scales along edges, obliquely truncate near base, finely sulcate, gradually narrowed into filiform beak about 1.7–2.5 cm long, thickened above and with tuft of hairs; pappus 2.5–3 cm long, yellowish golden, lustrous, with prominent, sparse, longer hairs, shorter than achenes with beak; inner achenes weakly rugose and almost smooth. Flowering May to June; fruiting June to August. (Plate VII, Fig. 2.)

Dry slopes in the foothills and middle mountain zone, bottomlands, scrubs, steppes and as weed in crops.—*Soviet Central Asia*: Balkhash Region, Aralo-Caspian, Syr-Darya, Pamiro-Alai, Tien Shan, mountainous Turkmenia. *General distribution*: Possibly distributed in neighboring parts of Iran and Afghanistan. Described from Katta-Karamuk River in Kirgizia. Type in Leningrad.

Note. Differs from *T. dubius* Scop. by having larger achenes with a very long and thin beak, peduncles at fruiting very strongly clavate, up to 1.5 cm wide, and larger capitula.

Series 2. Paradoxi Boriss. Leaves linear-lanceolate to broadly oblong, up to 4 cm wide; peduncles clavate; capitula large; florets yellow, whitish or pale lilac on drying; achenes with weakly sculptured, almost smooth,



Plate VII.

1—*Tragopogon heterospermus* Schweigg.; 2—*T. capitatus* S. Nikit.;
3—*T. sibiricus* Ganesch.

five-angled, with long, slender, and smooth beak, not or indistinctly thickened at apex, with annulus of hairs near pappus base.

3. **T. paradoxus** S. Nikit. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (1933) 200; Boriss. in Fl. Turkm. VII, 292; Kovalevskaja in Fl. Uzb. VI, 434.—*T. maracandicus* M. Pop. in Tr. Uzb. Gos. Univ. N. S. 27; Biol. 14 (1941) 95.—**lc.**: Fl. Turkm. VII, Plate XLIV, Fig. 1.

Biennial or perennial. Root cordlike, thick, vertical; root collar covered with remnants of old leaves. Plant large, glabrous, 40–100 cm high, more or less branched from base. Stem usually robust, densely leafy, especially at base. Leaves linear-lanceolate to oblong-lanceolate and oblong, usually up to 4 cm wide, semiamplexicaul, acuminate. Peduncles clavate below capitula at fruiting, 8–15 mm thick. Capitula large, 6.5–9 cm long at fruiting, with 50–60 achenes. Involucral bracts eight or nine, lanceolate-linear or linear, acuminate, up to 10 mm wide at base, slightly longer than florets, shorter or almost as long as achenes, sometimes membranous along margin in lower part. Florets yellow, whitish or pale lilac on drying. Peripheral achenes with pappus 7–7.5(8) cm long; without pappus 3.5–4(5.5) cm long, whitish; body of achene 1.6 cm long, about 2 mm wide, slightly concave, five-angled, somewhat attenuate at base and obliquely truncate, smooth, sometimes weakly scabrous-tuberculate along ribs in upper part, abruptly narrowed into slender, 2 cm long, finely sulcate, smooth beak, at apex only slightly and briefly broadened, with tuft of dense fluff; beak longer or almost as long as body of achene; pappus about 3.5 cm long, with unequal hairs, dirty white or light colored, somewhat shorter than achene with beak; inner achenes edged, weakly ribbed, smooth or very weakly sculptured in upper part. Flowering April to June: fruiting May to July.

- 135 In mountains near the lower boundary of the juniper forest zone, at zone of contact with herb-feathergrass steppe, on stony and clayey slopes at 800–2,500 m.—*Soviet Central Asia*: Pamiro-Alai, mountainous Turkmenia (Kugitang Range). *General distribution*: Possibly distributed in neighboring areas of Iran and Afghanistan. Described from vicinity of Baldzhuan. Type in Leningrad.

Note. *T. paradoxus* S. Nikit. is well distinguished from other species by the weak sculpturing of the large achenes. Very variable in leaf width and length.

4. **T. serawschanicus** S. Nikit. in Tr. Bot. Inst. Akad. Nauk SSSR, 1, I (1933) 200; Kovalevskaja in Fl. Uzb. VI, 433.

Perennial or biennial. Root woody, robust, vertical; root collar more or less without leaves or with isolated old leaves. Plant glabrous, 25–50 cm high. Stems somewhat slender, usually simple or branched almost

from base, usually few (two or three) from a single root. Cauline leaves broadly lanceolate, about 10 cm long, 1–2 cm wide, slightly narrowed toward base, semiamplexicaul, acute, but not acuminate; upper leaves reduced. peduncles 10–20 cm long, exceeding leaves, slightly thickened at fruiting, 2–5 mm thick. Capitula 6–7 cm long, few, usually one or two, with 11–25 achenes. Involucral bracts (seven) eight, linear-lanceolate, long-acuminate, shorter than achenes by 1–2 cm; florets yellow. Peripheral achenes with pappus about 5.5 cm long, without pappus 3–3.6(4) cm; achenes without beak about 1.7–2.3 cm long, 2 mm wide, five-angled, ribbed, finely squamose-tuberculate, usually slightly attenuate in lower part, distinctly narrowed into long and slender 1.3–1.7 cm long beak slightly shorter than thicker part [body] of achene, smooth, not thickened at apex, with a dense annulus of hairs; pappus whitish, 2.5 cm long, shorter than achene with beak. Flowering July; fruiting August.

Mountain slopes.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Zeravshan Range. Type in Leningrad.

5. **T. pseudomajor** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937) 258.—*T. majus* auct. fl. turk. et fl. ross. or. ex parte, non Jacq.

Biennial. Root vertical, somewhat slender or robust; root collar with remnants of old dry leaves. Plant glabrous, 25–80(100) cm high. Stem branched from middle or simple, rather densely leafy. Lower leaves linear-lanceolate or linear, basally broad, semiamplexicaul; upper leaves oblong-ovate from base or oblong-lanceolate, 10–20 mm wide at base, gradually narrowed into narrow, acuminate, sometimes filiform lamina. Peduncles of fertile capitula clavate, 5–10 mm thick, fistular, usually short, almost as long as inflorescence or much longer. Capitula at fruiting cylindrical, 3.5–5 cm long, 1–3 cm wide. Involucral bracts six to eight, as long as or shorter than achenes and far exceeding florets; florets yellow. Peripheral achenes with pappus about 4.8 cm long, without pappus 2.5 cm long; achenes excluding beak about 1.4 cm long, about 2 mm wide, straight, distinctly five-angled in cross section, finely and acutely squamose, weakly sulcate, rather distinctly narrowed into straight, somewhat thick or slender beak which is shorter than body of achene, about 1.1 cm long, more or less glabrous, with hairy annulus at apex and practically not thickened or slightly thickened; pappus about 2.3 cm long, almost as long as achene or slightly shorter, yellowish. Flowering June to July; fruiting July to August.

Grassy, meadow-covered slopes of mountains, in river valleys and fields at 1,200–2,200 m.—*Soviet Central Asia*: Aralo-Caspian (eastern part), Balkhash Region, Dzhungaria-Tarbagatai, Syr-Darya, Tien Shan,

Pamiro-Alai. *General distribution*: Dzhungaria-Kashgaria. Described from Talass Alatau. Type in Leningrad.

Note. It differs from *T. dubius* Scop. by the narrower cylindrical capitula with six to eight involucre bracts (and not 10–12), achenes shortly and abruptly narrowed at the apex, thick stems, peduncles strongly thickened below the capitula and quite short, large capitula and by the form of the leaves. From *T. capitatus* S. Nikit. it is distinguished by the size and structure of the achene, etuberculate and quite thick, straight beak (and not with a clearly developed white tubercle at the apex with a long, slender beak, which exceeds the length of the achene), as well as involucre bracts that are shorter than the achenes. A fodder plant.

Section 2. *Kemularia* Boriss. sect. nova in Addenda XXVIII, 723. —Peduncles strongly thickened; involucre bracts eight; capitula large; florets yellow, shorter than involucre bracts; beak of achenes about 2 cm long, slender, bent, smooth, clavate at apex, abruptly joined with deeply sulcate body of achene with acute prominent rugose ribs; pappus shorter than achene with beak; plant biennial.

Type of section: *T. kemulariae* Kuthath.

6. ***T. kemulariae*** Kuthath. in Zam. po Sist. i. Geogr. Rast. Tbil. 17 (1953) 28; Kuthath. Fl. Gruzii VIII, 623; Kavk. Predst. Tragop. (1957) 60; Fl. Azerb. VIII, 512.—**lc.**: Kuthath. (1953) Fig. 1; op. cit. (1957) Plate IX, Fig. 31, Map No. 10.

Biennial. Root cordlike, cylindrical, straight; root collar without old leaves. Plants more or less flocculose and weakly pubescent; stem erect, cylindrical, finely sulcate, 35–60 cm high, simple or sparingly branched, with single capitulum each. Basal leaves linear, often folded, sometimes with fine white border along margin, long, but not exceeding stems; cauline leaves to linear, broadened from base, gradually acuminate toward apex; upper leaves semiamplexicaul, not exceeding inflorescence, finely acuminate, broadened from base. Peduncles strongly thickened below capitula. Capitula up to 6–8 cm long; florets yellow, shorter than involucre; involucre bracts eight, linear, gradually narrowed from broad base to filiform apex, exceeding florets and achenes, 6–8 cm long. 137 Peripheral achenes with pappus about 5 cm long, without pappus 3.1 cm long, curved; body of achene 1.1 cm long, five-angled, with sharply projecting ribs and five rather deep furrows, ribs with indistinct sculpture in the form of somewhat acute scales, abruptly narrowed into filiform, slender, bent and smooth, about 2 cm-long beak, clavate at apex and with hairy annulus; pappus about 2.5 cm long, golden-yellow; inner achenes up to 5.8 cm long and with up to 2.4 cm-long beak, with smooth or weakly rugose body of achene along ribs, basally almost

smooth; pappus shorter than achene with beak. Flowering May to July; fruiting July to August.

Subalpine zone, in dry areas at 1,700–1,990 m.—*Caucasus*: Eastern Transcaucasia (Georgia, Dzhavakhetia, Azerbaidzhan), Southern Transcaucasia, Talysh. Described from region between villages of Bezhanu and Khumrisi. Type in Tbilisi.

Section 3. Angustissimi Kuthath. Kavk. Predst. Tragop. (1957) 34. Peduncles gradually and slightly thickened below capitula, straight; capitula narrowly cylindrical, large, about 5 cm long; involucre bracts five to seven (eight), longer than ligulate florets; florets yellow or reddish-violet. Achenes gradually narrowed into slender beak, shorter than body of achene; pappus almost as long as achene (slightly longer or somewhat shorter); plant biennial.

Type of section: *T. sosnovskyi* Kuthath.

7. *T. sosnovskyi* Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 15 (1949) 94; Kuthath. Kavk. Predst. Tragop. (1957) 35; Kuthath. in Fl. Azerb. VIII, 506.—*T. crocifolium* auct. non L.: C.A. Mey. Verzeichn. (1931) 61; Ldb. Fl. Ross. II (1844–1846) 788, quoad pl. Talüsch.—*T. angustissimus* auct. non S. Nikit.; Grossh. Fl. Kavk. IV (1934) 231.—*T. vvedenskyi* auct. non M. Pop. ex Pavl.; Grossh. Opred. Rast. Kavk. (1949) 507.—*Ic.*: Kuthath. op. cit. (1957) Plate IV, Fig. 14, Map No. 6.

Biennial. Root straight or sinuate, slightly thickened; root collar usually with remnants of previous year's leaves. Plants aeruginous, weakly flocculose at stem base. Stem 30–50 cm high, erect, solitary, angular, branched and thickened in forks. Leaves narrowly linear to filiform, long; cauline leaves shorter, broadened at base, semiamplexicaul, uppermost leaves very short, abruptly narrowed and acuminate. Capitula solitary, terminal on branches, rather large, about 5 cm long, cylindrical; peduncles gradually thickened below capitula, especially at fruiting. Involucre bracts five to eight, narrowly lanceolate, exceeding florets, as long as achenes with pappus or longer, weakly pubescent at base or 138 glabrous; florets reddish violet. Achenes with pappus about 4.2 cm and without pappus 2 cm long, 1.5 mm wide, without beak 1.4 cm long, finely tuberculate-squamose and sulcate, gradually narrowed into slender, about 0.6 cm long, glabrous and clavate beak at apex; pappus dirty white, about 2.2 cm long, without hairy annulus at base. Flowering April to May; fruiting June to July.

Dry stony and cobbly slopes, in mountain-steppe communities, to upper mountain zone.—*Caucasus*: Eastern and Southern Transcaucasia, Talysh. Endemic. Described from Armenia. Type in Tbilisi.

Note. Based on the achenes, it is similar to *T. vvedenskyi* M. Pop.

ex Pavl. But differs from the latter by its red-violet florets (and not yellow), shorter involucre bracts, and peduncles thickened below the capitula and by the range and ecology.

8. ***T. segetus*** Kuthath. in Zam. po Sist. i. Geogr. Rast. Tbil. 17 (1953) 33; Kuthath. Kavk. Predst. Tragop. (1957) 37.—**lc.**: Kuthath. *ibid.* (1957) Plate IV, Fig. 15 (incorrect), Map No. 6.

Biennial. Root thick, vertical; root collar with remnants of leaves. Plants loosely flocculose, up to 45 cm high. Stem erect, solitary, very densely leafy, strongly branched above, nodose at base of branches, flocculose at nodes. Basal leaves narrowly linear to filiform, folded, long; cauline leaves exceeding capitula. Peduncles thickened below capitula, weakly pubescent; capitula about 4 cm long. Involucre bracts five to seven, longer than florets, as long as achene with pappus at fruiting, narrowly lanceolate, long-acuminate, broadened toward base; florets yellow. Achenes with pappus 3.5–4 cm long, without pappus about 2 cm long and 1 mm wide, more or less distinctly ribbed, whitish, shallow-sulcate, glabrous; beak slender, about 0.9 cm long, without thickening and hairy annulus at apex; pappus about 1.8 cm long, shorter or as long as achenes. Flowering June.

Wheat fields in the lower and middle mountain zones.—*Caucasus*: Southern Transcaucasia. Endemic. Described from Armenia. Type in Tbilisi; isotype in Leningrad.

Note. It differs from the closely related species *T. sosnovskyi* Kuthath. by having a densely leafy stem, larger capitula, thicker peduncles, yellow florets, and deeply sulcate, ribbed, white achenes.

9. ***T. vvedenskyi*** M. Pop. ex Pavl. in Byull. Mosk. Obshch. Isp. Priro. XLII (11 XII 1933) 138; Boriss. in Fl. Turkm. VII (1960) 294; Kovalevskaja in Fl. Uzb. VI, 432.—*T. angustissimus* S. Nikit. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (28 XII 1933) 194.—**lc.**: Pavlov, *op. cit.* Fig. 4.

Biennial. Root cordlike, rather short, 5–7 mm thick; root collar with remnants of previous year's leaves. Plant smooth, glaucous, usually arachnoid-tomentose below when young, erect, with slender stem, usually strongly branched and densely leafy, 30–60 cm high. Lower leaves 139 numerous, very thin, glabrous; cauline leaves herbaceous, narrowed from weakly broadened base into narrowly linear, sometimes filiform, 2–5 mm-wide lamina folded along keel; upper leaves usually reduced, as also middle cauline leaves, not exceeding inflorescence. Peduncles in fertile plants 1–6 cm long, 2–4 mm thick, slightly thickened below capitula; fertile capitula narrowly cylindrical, 40–50 mm long, (5)10 mm wide. Involucre almost two times as long as florets, slightly

exceeding achenes with pappus or as long; involucre bracts narrowly lanceolate, five; florets yellow. Achenes 10–18 (up to 30) in a capitulum; peripheral achenes more or less straight or slightly bent, with pappus about 3.6 cm long, without pappus 1.8–2.1(2.4) cm long, 1.5 mm wide in body; achenes excluding beak about 1.1 cm long, indistinctly obtusely five-angled, finely sulcate, finely white-tuberculate or squamose along ribs, gradually narrowed into finely sulcate, white, 4–7(9) mm long beak, inflated at apex and sparsely hairy, but without hairy annulus at pappus base; pappus brownish-white, sometimes reddish, about 2 cm long, almost as long as achene with beak or slightly longer; inner achenes smooth in lower part, with distant scales above, indistinctly sculptured. Flowering May to June; fruiting May to August.

Plants widely distributed on mountain-steppe grassy and stony slopes, at bottom of ravines, from forest zone to subalpine zone, at 1,400–2,000 m.—*Soviet Central Asia*: Tien Shan (Talass Alatau, very rarely in southwestern part of Karatau Range), Pamiro-Alai (Zeravshan, Hissar, Turkestan and Alai ranges, Kugitang), mountainous Turkmenia (Kopetdag). Endemic. Described from Boroldai Mountain in Karatau Range. Type in Moscow; isotype in Leningrad.

Note. In the Kopetdag, var. *turcomanicus* Boriss. occurs, which is distinguished by a longer beak (up to 9 mm long) and slightly larger capitula.

Section 4. *Macropogon* (Kuthath.) Boriss. comb. nov. emend.—Ser. *Macropogon* Kuthath. Kavk. Predst. Tragop. (1957) 49, p. p.—Peduncles slightly thickened below capitula at fruiting; capitula solitary, 4–5 cm long at fruiting, on straight long peduncles; involucre bracts eight, shorter than achenes and slightly longer than florets; florets pale yellow; body of achene deeply sulcate and densely tuberculate, 6–7 mm long, abruptly narrowed into slender, long beak which is one and one-half times as long as body; pappus almost three times as long as achene with beak; plants biennial.

Type of section: *T. macropogon* C.A. Mey.

10. ***T. macropogon*** C.A. Mey. in Bull. Soc. Nat. Mosc. XI (1838) 273; Ldb. Fl. Ross. II, 785; Kuthath. Kavk. Predst. Tragop. (1957) 49; Kuthath. Fl. Azerb. VIII, 510.—*T. major* auct. non Jacq.: C.A. Mey. Verzeichn. (1831) 61, excl. syn.; Kuthath. in Fl. Gruzii VIII, 620, p. 140 p.—*T. majus* auct. non Jacq.: Boiss. Fl. or. III (1875) 747, non Jacq. p.—**lc.**: Kuthath. op. cit. Plate VII, Fig. 22, Map 9.

Biennial. Root vertical, almost fusiform, brown, rather slender; root collar smooth or with remnants of dry leaves. Plant glabrous, 25–50 cm high; stem simple, strawlike, cylindrical, glabrous or almost glabrous,

angular, branched almost from base, with long branches, densely leafy. Leaves upright, straight, linear-lanceolate, glaucescent, glabrous or almost glabrous, not bent at apex, gradually acuminate, not broadened at base and not semiamplexicaul, 10–12 cm long, 4–6 mm wide, flat; basal and cauline leaves not exceeding inflorescence. Peduncles fistular, somewhat thickened at fruiting below capitula. Involucral bracts eight, glabrous, lanceolate-linear, long-acuminate, at flowering 3–3.5 cm long, somewhat longer than florets, about 5 cm long at fruiting, 3–4 mm wide at base, flat, shorter than achenes; florets pale yellow, shorter than involucral bracts, outer florets 2.5–3 cm long. Achenes with pappus 4.5–5 cm long, without pappus 1.3–2 cm long; body of achene 0.6–0.7 cm long, about 1 mm wide, sulcate, densely squamose-tuberculate, with 10 ribs, abruptly narrowed into slender 0.7–1.2 cm-long beak, finely sulcate, apically with hairy annulus below pappus and usually not inflated; pappus 3.5–3.8 cm long, almost three times as long as achene with beak, golden-yellow, lustrous, with plumose simple hairs at apex; inner achenes longer, with longer beaks. Flowering May to June; fruiting June (Plate VIII, Fig. 1).

Meadows and sandy places along seacoasts.—*Caucasus*: Eastern Trnscaucasia, Talysh. Endemic. Described from Talysh. Type in Leningrad.

Section 5. Krascheninnikovia Boriss. sect. nov. in Addenda XXVIII, 723.—Ser. *Robusti* Kuthath. Kavk. Predst. Tragop. (1957) 38, p. p.—Peduncles slightly thickened below capitula, straight; capitula large, 6–8 cm long, cylindrical; involucral bracts seven or eight, less often 12, far exceeding florets; florets dark violet or raspberry-colored; achenes large, with long and slender bent beak, gradually merging with finely sulcate and acutely tuberculate body of achene; plants biennial.

Type of section: *T. krascheninnikovii* S. Nikit.

Series 1. Longirostres Boriss.—Beak slender, bent, longer than body of achene.

11. *T. krascheninnikovii* S. Nikit. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (1933) 191; Boriss. in Fl. Turkm. VII, 297; Kuthath. in Fl. Azerb. VIII, 508; Kovalevskaja in Fl. Uzb. VI, 431.—*T. longirostris* auct. fl. turk. et cauc. non Bischof.—*T. clavulatum* S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. nauk SSSR, VII, 12 (1938) 263.—*T. clavatum* 141 S. Nikit. ex Zakir. Fl. i Rast. Zeravsh. 2 (1962) 413, sphalm.—*lc.*: Kuthath. Kavk. Predst. Tragop. (1957) Plate V, Fig. 16; Borissova, op. cit, Plate XLV, Fig. 1.

Biennial. Root cordlike, robust, vertical; root collar covered with remnants of old leaves. Plants glabrous, 30–100(120) cm high, usually branched in lower part. Lower and middle cauline leaves linear-lanceolate

and linear, with slightly broadened semiamplexicaul base. Peduncles slightly thickened below capitulum, 3–6 cm thick, longer than capitula. Capitula cylindrical, large, 6–8 cm long, 1–1.8 cm wide. Involucral bracts seven or eight, rarely 12, almost two times as long as florets, as long as achenes or slightly longer, lanceolate-linear or linear, acuminate, membranous along margin in lower part; florets dark violet, raspberry-colored or purple. Achenes 16–50 per capitulum, straight, whitish, with pappus 6–7 cm long, without pappus 3.2–4 cm long; body of achene 1.3–2 cm long, 2 mm wide, indistinctly five-angled in cross section, finely sulcate, finely and densely acutely tuberculate, scabrous; gradually narrowed into slender, bent, 1.5–2.7 2.7(3) cm long beak, clavate at apex, smooth and glabrous, scabrous in lower part, and with hairy annulus at apex; pappus 2–3.5 cm long, with isolated long hairs, dirty white, one and one-half to two times as long as body of achene. Flowering April to May; fruiting May to August.

Mostly in the foothills, in mountains on steppe slopes, screes and cobbly dry slopes, sometimes in old fields and crops.—*Caucasus*: Eastern and Southern Transcaucasia, Talysh; *Soviet Central Asia*: Aralo-Caspian (Beleuty), Tien Shan (southern Kirgizia), Pamiro-Alai, mountainous Turkmenia. *General distribution*: Distribution in Iran possible. Described from Gaudan in Kopetdag Range. Type in Leningrad.

Note. *T. longirostris* Bischof, belongs to this series, which differs from *T. krascheninnikovii* S. Nikit. in pubescence, achene with indistinct edges, length of the pappus, peduncles, cauline leaves, etc.

Section 6. Tragopogon.—Peduncles not thickened below capitula or weakly thickened at fruiting. Capitula solitary, usually medium, on long straight peduncles; involucral bracts 6–11, often seven or eight; florets of various shades of yellow, pale violet, or purple; beak of achene slender, smooth, as long as body of achene or slightly shorter; pappus slightly shorter, as long or slightly longer than achene with beak; biennial or, less often, perennial plants.

Type of section: *T. pratensis* L.

Series 1. Orientales Artemcz. in Uch. Zap. Chernov Univ. I (1948) 88, p. p. Peduncles not thickened or slightly thickened at fruiting; involucral bracts 7–11; florets yellow, whitish-yellow, or orange, sometimes pale lilac on drying. Mostly biennials.

- 142 12. **T. orientalis** L. Sp. pl. (1753) 789; Ldb. Fl. Ross. II, 786; Boiss. Fl. or. III, 747; Kryl. Fl. Zap. Sib. XI, 2977; C. Rgl. in Ber. Schweiz. Bot. Gesellsch. 61, Map 4.—*T. pratense* auct. fl. ross. p. p.—*T. pratense* β . *orientale* Schmalh. Fl. II (1897) 146; Kyrl. Fl. Alt. III, 729; Fedtsch. and Fler. Fl. Evrop. Ross. 1043.—**!c.**: Hegi, Ill. Fl. VI, 2,

Taf. 275, f. 4; Javroka and Csapody, Iconogr. Fl. Hung. (1929) 3993.

Biennial. Root string-like, vertical, cylindrical. Plants 12–60(90) cm high, glabrous, with individual flocculose scales. Stems sulcate, erect, simple or branched. Leaves light-colored, glaucous-green, linear or linear-lanceolate, acute, flat or sinuate, slightly narrowed in upper part and broadened near base, amplexicaul; lower leaves 10–40 cm long, 3–18(24) mm wide, upright, sometimes arcuate; upper leaves amplexicaul, shorter and wider, 3–8 cm long, 3–10 mm wide, long-acuminate, lanceolate, sometimes sinuate. Peduncles not thickened below capitula; capitula large, one each on long glabrous peduncles. Involucral bracts 8–10, lanceolate, 2.5–4 cm long, 8–12 mm wide, with greenish-white margin, much shorter than peripheral florets and almost as long as achenes or slightly shorter. Florets bright-colored, golden-yellow, or orange-yellow, up to 15 mm long, often whitish on drying; anthers yellow, with dark brown or almost black longitudinal stripes. Peripheral achenes with pappus about 3.9 cm long, without pappus 2.2 cm long; body of achene curved, weakly five-angled, scabrous or sharp-toothed-tuberculate from somewhat acute or subobtusate scales, sometimes shallow sulcate or smooth, almost glabrous in lower part, gradually narrowed into slender, about 0.9 cm-long beak, which is broadly inflated at apex and with hairy annulus, longer than body of achenes or shorter; pappus about 1.6 cm long, much shorter than achene, whitish. Flowering May to August (September).

Meadows and dry slopes, forest glades, old fields and loamy soils in pine forests. A common, widely distributed plant.—*European Part*: Volga-Kama, Upper Volga, Upper Dnieper, Middle Dnieper, Volga-Don, Trans-Volga, Black Sea Region, Lower Don, Lower Volga; *Western Siberia*: Upper Tobol; *Eastern Siberia*: Angara-Sayans (introduced into Kransnoyarsk and up to Sayans foothills, near Posolsk in Baikal); *Soviet Central Asia*: Aralo-Caspian Region. *General distribution*: Central Europe. Described from western Europe. Type in London.

Note. According to Nikitin, *T. orientalis* L. is a southeastern species, whose range comes in contact in the mountain systems of the Siberian water divide, with the range of *T. songoricus*. According to Artemczuk, *T. orientalis* L. is a Balkans-Asia Minor species. The opinion of S.A. Nikitin is closer to reality. *T. orientalis* L. is distributed in the forest-steppe and steppe zone of the RSFSR (*T. pratensis* L. is the species replacing it to the northwest in the forest belt). The varieties recognized are: *T. orientalis* var. *revolutus* Bisch.—with arcuate, sinuate leaves; var. *laevigatus* Beck.—with an indistinct sculpturing of the achenes; and var. *tortile* C.A.M.—with undulate, weakly convolute leaves.

Stank. and Tal. Opređ. Vyssh. Rast. 689; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 4.—*T. pratense* α. *vulgaris* Schmalh. op. cit.—*T. minor* Fries, Novit. fl. Suec. ed. 2 (1828) 241.—(?) *T. carinatum* Gilib. Fl. Lithuan. I (1792) 183.—**Ис.**: Fedtsch. and Fler. Fl. Evrop. Ross. Fig. 1066; Hegi, Ill. Fl. VI, 2, t. 275, f. 5.

Biennial. Root vertical, robust, cylindrical, with numerous slender and short lateral roots; root collar covered with fibers. Plants glabrous, 30–90(120) cm high; stems simple or branched, straight, mostly robust, sometimes colored. Leaves long, linear or lanceolate-linear, basally semiamplexicaul, broadened and abruptly narrowed, finely long-acuminate, sometimes undulate along margin, almost carinate in upper part; middle and upper cauline leaves much shorter than lower ones. Peduncles long, significantly exceeding leaves, straight, glabrous, not thickened below capitula. Capitula solitary terminal on stem and branches, at flowering 2.5–3 cm long, 12–20 mm wide, elongated at fruiting. Involucral bracts 8–10, lanceolate or linear-lanceolate, 2.5–4 cm long, 8–12 mm wide, long-acuminate, sometimes brown or pale in lower part, sometimes shorter than peripheral florets and achenes, white-bordered. Receptacle glabrous, initially flat, later on weakly convex, punctate-alveolate. Florets light yellow; anthers yellow, sometimes turning black at apex. Achenes with pappus 3–4 cm long, without pappus 2–2.3 cm long, blackish or brownish-gray; body of achene slightly curved, sulcate, scabrous due to small subobtus tubercles along ribs, somewhat thick, about 1.1 cm long, abruptly narrowed into 0.8–1 cm-long, slender and smooth beak as long as body of achene, not swollen at apex, and with hairy annulus; pappus 1–1.5 cm long, shorter than achene with beak, whitish. Flowering May to September.

Meadows, meadow slopes, forest glades, borders of fields, roadsides and old fields.—*European Part*: Karelia-Lapland, Dvina-Pechora, Baltic Region, Ladoga-Ilmen, Upper Volga, Upper Dniester. *General distribution*: Scandinavia, central Europe, Atlantic Europe. Described from western Europe. Type in London.

Note. This species replaces *T. orientalis* L. in the northwest. It is a fodder and honey-bearing plant.

14. **T. bjelorusicus** Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 31; Klovov in Vozn. Rosl. USSR, 590; Stank. and Tal. Opređ. Vyssh. Rast. 691; Mikhail. in Fl. BSSR, V, 177.—*T. brevirostris* DC. subsp. *bjelorusicus* (Artemcz.) C. Rgl. in Ser. Hort. Bot. Univ. Vytauti Magn. V (1937) 41; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 1.—**Ис.**: Artemcz. op. cit. Fig. 1, p. 32; C. Rgl. op. cit. (1937) Abb. 4 and 14.

Biennial. Root vertical, fusiform; root collar with remnants of old

dry leaves. Plants 14–35 cm high, whitish-flocculose-tomentose, densely below capitula and near leaf base. Stems solitary or few, often branched from base. Basal leaves narrowly linear, 10–25 cm long, broader at base and flat, 2–5 mm wide, whitish-lilac below, sometimes folded, not exceeding fertile branches; cauline leaves wider, narrowed toward apex and bent, subulately acuminate, 2–6 cm long; upper leaves reduced, 2–4 mm wide at base, 2–6 cm long, gradually subulately acuminate. Peduncles below capitula not thickened; involucre bracts 7–11, at fruiting elongated up to (25)30–40 mm, basally 5–9 mm wide, shorter than florets, subulate, sometimes violet. Florets whitish-yellow, whitish on drying, peripheral florets more or less one and one-half times as long as involucre. Achenes yellowish, smooth, roundish, five-angled, 3.3–3.5 cm long with and 1.7 cm long without pappus, about 1 mm wide, very shallow- and obtusely ribbed and finely squamose; beak 0.5–0.7 cm long, more or less one-third as long as achene, glabrous; pappus whitish-golden, 1.2–1.7 cm long, shorter than achenes, with short hairy annulus at base. Flowering June to July (September). (Plate XI, Fig. 1.)

Coastal sands and pine forests.—*European Part*: Upper Dnieper (Pripyat and Dnieper valleys). Endemic. Described from Mozyr District. Type in Leningrad.

Note. Artemczuk (op. cit.) describes var. *trachycarpus* Artemcz. with grayish cylindrical achenes having 10 scabrous ribs.

15. **T. trachycarpus** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937) 259; Popov, Fl. Sredn. Sib. II, 72.—*T. pratense* var. *griseocinerascens* Genesch. in Tr. Bot. Muz. Akad. Nauk, XVIII (1915) 224.

Biennial. Root cordlike, vertical, robust; root collar covered with remnants of previous year's leaves. Plants glabrous, 50–90 cm high. Stems branched in upper part, strong, erect, densely leafy. Leaves not exceeding peduncles; lower leaves linear, cauline leaves semiamplexicaul, 10–15(26) mm wide, basally narrowed into filiform, long-folded lamina; upper leaves shorter. Peduncles 7–10 cm long at fruiting, not or very weakly thickened below capitulum. Capitula with mature achenes 40–50 mm long, 15–20 mm at flowering. Involucre bracts eight, almost as long as florets and achenes; young involucre bracts in lower part sericeous, brownish, sometimes with red dots. Peripheral florets light yellow above, dirty violet below (according to Ganeschin). Peripheral achenes with pappus about 3.5 cm long, without pappus about 2 cm long; achenes without beak 1 cm long, shallow-sulcate, five-angled, weakly scabrous along ribs or almost smooth; beak slender, smooth, about 1 cm long, not swollen above (without knob), with weakly developed tuft of hairs; pappus about 1.5 cm long; usually shorter than achene with beak, brownish. Flowering June to July; fruiting July to August.

145 Meadows, along shores, sometimes as weed in gardens.—*Eastern Siberia*: Dauria. Endemic. Described from Transbaikian Region (Akhur River). Type in Leningrad.

Note. *T. trachycarpus* S. Nikit. is widespread at the eastern boundary of the genus. It is distinguished from *T. sibiricus* Ganeschin by the light yellow and dirty violet, not dark red-purple, color of the corolla below, smooth achenes (and not sulcate and weakly scabrous) with the beak longer than the achene, involucre bracts almost as long as florets and achenes, and also by the form and length of the leaves. Popov (op. cit.) suggested a hybrid origin for *T. trachycarpus* S. Nikit. (*T. orientalis* × *T. sibiricus*), which is doubtful, because these two species are not found together.

Series 2. *Turkestanici* Boriss. Peduncles not or weakly thickened below capitula at fruiting; involucre bracts seven or eight (nine), as long as or slightly shorter than achenes; florets yellow, orange, or pale yellow, pale lilac on drying; achenes with slender beak, transition to body of achene abrupt. Biennial, less often annual, montane species of Soviet Central Asia and Altai.

Of the species assigned to this series, *T. karelinii* S. Nikit. and *T. tomentosulus* Boriss., possibly belong to other groups; material of these species is insufficient in the collections.

16. ***T. songoricus*** S. Nikit. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (1933) 198; Kryl. Fl. Zap. Sib. XI, 2979.

Biennial. Root vertical, robust; root collar covered with dry remnants of previous year's leaves that are basally broad. Stems rather robust, 25–50 cm high, erect, glabrous, more or less branched from middle. Lower leaves narrowly linear, sometimes dropping off after flowering, more or less amplexicaul; middle leaves linear-lanceolate, broader at base, semiamplexicaul, narrowed toward apex into linear-lanceolate lamina; upper cauline leaves oblong-lanceolate and oblong, long- and filiform-acuminate, basally broadened and almost amplexicaul. Peduncles 5–11 cm long, not thickened at fruiting; capitula 3.5–4 cm long, with 18–40 achenes. Involucre bracts seven or eight (nine), slightly exceeding florets at flowering, very rarely slightly shorter than achenes, sometimes with dark dots at base, membranous along margin, sometimes sericeous below; florets yellow. Peripheral achenes with pappus 3.2–3.6 cm long, without pappus 1.7–1.8 cm long; body of achene 1–1.2 cm long, curved, finely ribbed, five-angled, finely tuberculate only along ribs, rather abruptly narrowed into slender, smooth 0.6–0.8 cm long beak, without hairy annulus and thickening at apex; pappus 1.6–1.8 cm long, dirty white. Flowering July to August.

In mountains on meadows and dry slopes, in feather grass-herb

146 steppes, thickets of shrubs, moist meadows, forest edges.—*Western Siberia*: Altai (southwest); *Soviet Central Asia*: Balkhash Region, Dzhungaria-Tarbagatai, Tien Shan. *General distribution*: China, Mongolia. Described from Ketmen Range. Type in Leningrad.

Note. *T. songoricus* S. Nikit. is the species replacing *T. turkestanicus* S. Nikit. ex Pavl. to the north of the Trans-Ili Alatau. It differs from *T. turkestanicus* S. Nikit. ex Pavl. by longer involucre bracts, smaller capitula, and a shorter beak without a hairy annulus at its apex. From *T. orientale* L., it is distinguished by an involucre that exceeds the florets, a shorter beak abruptly joining the broader part of the achene, and by the sculpture of the achenes. A food and fodder plant.

17. ***T. turkestanicus*** S. Nikit. ex Pavl. in Byull. Mosk. Obshch. Isp. Priro. XLII, 2 (11 XII 1933) 136; S. Nikitin in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (28 XII 1933) 196; Kovalevskaja in Fl. Uzb. VI, 433.—*T. pratense* auct. fl. As. Med. p. p.—*T. pseudoprattense* M. Pop. in herb.—**lc.**: Pavlov, op. cit. Fig. 3.

Biennial. Root robust, mostly vertical. root collar covered with dry remnants of previous year's leaves. Stems (25)50–100 cm high, mostly solitary, glabrous, erect, robust, simple, less often more or less branched in upper part. Lower leaves flat, linear or linear-lanceolate, 5–7 mm wide, like other leaves broadened at base, semiamplexicaul, acuminate at apex; middle leaves linear or linear-lanceolate, 3–4 mm wide, with wide, almost amplexicaul base, much shorter than lower leaves, abruptly narrowed upward into linear lamina, sometimes folded; upper cauline leaves reduced, oblong-lanceolate, shorter than internodes, filiform-acuminate, almost amplexicaul. Peduncles 5–11 cm long, at fruiting weakly thickened below capitula; capitula 3.5–5 cm long at fruiting. Involucre bracts seven or eight(nine), deltoid-lanceolate, 22–25 mm long, one and one-half times as long as florets, as fruiting as long as achenes or slightly shorter, sometimes reddish-brown and membranous along margin, sometimes lanate below; florets yellow. Peripheral achenes weakly concave, with pappus about 4 cm long, without pappus 2.2 cm long; body of achene about 1.2 cm long, sulcate, scabrous from fine tubercles along ribs, grayish, abruptly narrowed into slender, 1.1 cm-long beak, ribbed below, swollen at apex and with hairy annulus; pappus 1.8 cm long, dirty-white, shorter than achene with beak. Flowering May to July; fruiting June to September.

Foothills to forest and subalpine zones, on screes and stony slopes of ravines, in mountain meadows, at 1,000–2,600 m.—*Soviet Central Asia*: Tien Shan, Pamiro-Alai. Endemic. Possibly distributed in neighboring parts of Afghanistan. Described from Talass Alatau. Cotype in Leningrad.

Note. S.A. Nikitin described var. *massarifense* S. Nikit., growing in the Zeravshan and Turkestan ranges (op. cit. 196), on the basis of
147 larger capitula and achenes (up to 4.7 cm long) and a longer beak on the achenes (up to 1.4 cm long).]

18 T. badachschanicus Boriss. in Addenda XXVIII, 723.

Biennial. Root robust, long, vertical; root collar covered with dry white sheaths of previous year's leaves. Plants glabrous; stems 15–35 cm high, erect, branched from base. Lower leaves numerous, linear, 0.5–1.5 cm wide, abruptly narrowed toward apex, long-acuminate, folded, semiamplexicaul, not exceeding peduncles, 7–20 cm long; middle cauline leaves much shorter than lower ones, linear to lanceolate, semiamplexicaul, with many veins, sometimes with narrow white border. Peduncles exceeding leaves, at fruiting more or less thickened below capitula. Capitula at flowering about 2 cm long, and about 1 cm wide, at fruiting 3.5–5 cm long, numerous. Involucral bracts eight(nine), equaling florets at flowering or slightly shorter, at fruiting equaling or slightly exceeding achene, green, linear-lanceolate, gradually acuminate; florets pale yellow, pale violet on drying. Peripheral achenes slightly curved, with pappus 4.3 cm long, without pappus 2.6 cm long; body of achene about 1.3 cm long, five-angled, finely sulcate, scabrous from fine tubercles, abruptly narrowed into slender, smooth about 1.2 cm long beak, not swollen at apex, with hairy annulus at pappus base; pappus about 1.7 cm long, whitish-golden, brownish or dirty white in upper part, shorter than achene with beak. Flowering July. (Plate IX, Fig. 1.)

On stony steppe slopes, in grass patches along beds of mountain streams, at 3,200–4,200 m.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from locality of Kok-Dzhar in Pamir. Type in Leningrad.

19. T. altaicus S. Nikit. and Schischk. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12 (1937) 260.—*T. orientale* auct. fl. alt. ex parte.

Biennial. Root vertical, robust; root collar covered with remnants of previous year's leaves. Plants glaucous-green, glabrous, 30–60 cm high; stems branched from base or below middle, or simple, rather robust, 3–5 mm thick, sulcate, sometimes colored. Leaves not exceeding stem, semiamplexicaul, up to 10–20 mm wide in lower part; lower leaves linear and lanceolate-linear, crowded or remote, long-acuminate; middle and upper cauline leaves shorter, abruptly narrowed, sometimes contorted at apex. Peduncles strong, 3–5 mm thick, weakly broadened below fertile capitula. Capitula with broad base, at fruiting 1.5–3 cm wide, 2–4 cm long. Involucral bracts 8(10), lanceolate, broader at base, acuminate and divergent, as long as achenes, shorter than florets by 10–20 mm; florets

orange. Peripheral achenes slightly curved, with pappus about 3 cm long, without pappus about 1.7 cm long, sulcate, obtusely ribbed, with alternate, finely scabrous and smooth ribs, almost without sculpture; body of achene 2–3 mm wide, abruptly narrowed into 5–7 mm long beak, not swollen at apex and with annulus of scanty hairs, very finely sulcate, almost smooth; pappus 1.3 cm long, shorter than achene with beak. Flowering and fruiting June to August.

Mountain slopes.—*Western Siberia*: Altai. Endemic. Described from altai, from Sailyugem Mountain. Type in Leningrad

Note. It is distinguished from *T. orientalis* L. by the broader capitula, the shape, size and sculpture of the achenes, a beak that is shorter than the widest part of the achene, and the color of the corolla. From *T. pratensis* L. it differs by involucre bracts that are shorter than the florets, corolla color, achene shape, a shorter beak, as well as by the form of the capitula and leaves.

20. **T. karelinii** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12 (1937) 237.

Biennial or perennial. Root vertical, virgate. Plants 25–30 cm high; stems glabrous, finely sulcate. Leaves remote, with more or less broader base, 5–8(12) mm wide, semiamplexicaul, narrowed into linear-lanceolate lamina, weakly membranous along margin. Peduncles below capitula not thickened, about 3 mm thick. Involucre bracts seven or eight, almost as long as florets and much shorter than achenes. Capitula 20–30 mm long at flowering; 35–50 mm long at fruiting; florets pink (dry). Peripheral achenes with pappus about 4.8 cm long, without pappus 2.5 cm long; body of achene about 1.3 cm long and 1.5 mm wide, weakly sulcate, with scarcely noticeable scales, five-angled gradually narrowed into slender, about 1.1 cm long beak, almost as long as body of achene with weakly developed hairy annulus above; pappus about 2.3 cm long. Flowering May to June(?).

In semidesert.—*Soviet Central Asia*: Balkhash Region (Lake Balkhash). Endemic. Described from northern Kazakhstan. Type in Leningrad.

21. **T. tomentosulus** Boriss. in Fl. Turkm. VII (1960) 298 and in Addenda 381.—*T. conduplicatus* auct. fl. As. Med. non S. Nikit.

Biennial or perennial. Root virgate, weak, slightly thickened; root collar covered with fibrous remnants of old leaves. Stem 20–25 cm high, erect, somewhat slender, weakly branched, densely leafy, with leaves crowded at base. Leaves filiform-linear to lanceolate, appressed white-tomentose at base; lower leaves longer, exceeding others, reaching up to inflorescence, finely sulcate, finely acuminate, with somewhat



Plate VIII.

1—*Tragopogon macropogon* C.A. Mey.; 2—*Ceropogon glaber* L.;
3—*Tragopogon kasachstanicus* S. Nikit.

- 150 broader base, semiamplexicaul; upper leaves short, wider, long-acuminate, linear to oblong-lanceolate. Peduncles scarcely exceeding or equaling leaves, not thickened, 4–6 cm long, finely pubescent, tomentose below capitula. Capitula solitary, terminal, medium, 2–2.5 cm long at flowering, about 4 cm long and 1.5 cm wide in middle at fruiting. Involucral bracts eight, lanceolate, acuminate, pubescent at flowering, not exceeding florets, much shorter than achenes with pappus; florets violet. Achenes (immature) about 17 mm long with beak; body of achene sulcate, weakly scabrous above; beak about 6 mm long, slender, weakly scabrous below, more or less tomentose above, almost half as long as achene; pappus considerably longer than achene, about 2.5 cm long, brownish, with unequal plumose hairs. Flowering May to June; fruiting June.

Herb slopes of foothills up to zone of grassy steppes.—*Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Distribution in Iran possible. Described from Kopetdag Range. Type in Leningrad.

Series 3. Graciles Boriss. Peduncles not thickened; involucral bracts six, less often seven or eight, shorter or almost as long as florets and achenes; florets yellow, pale lilac or pinkish-violet on drying. Short perennials, branched from base, caespitose.

22. *T. gracilis* D. Don in Mem. Wern. Soc. III (1820) 414; Wall. Prodr. Fl. Nep. (1824–1826) 62; DC. Prodr. VII, 115; Hook. f. Fl. Brit. Ind. III, 417; Nikitin in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12, 272; Rech. f. Symb. Afghan. II (1955) 191; Kitam. Fl. Afghan. (1960) 452.—*T. pamiricus* S. Nikit. in Ikonn. Opred. Rast. Pamira (1963) 246, descr. ross.

Perennial. Root virgate, straight. Plants 10–20(25) cm high, caespitose, usually branched from base, young branches flocculose; stem slender. Leaves remote, narrowly linear, upright, often folded, slightly broader at base. Peduncles below capitula not thickened. Capitula narrowly cylindrical at flowering, 1.8–3 cm long, about 3–3.5 cm long at fruiting. Involucral bracts six (less often seven or eight), shorter than florets and achenes; florets yellow, pale lilac on drying, exceeding involucral bracts. Peripheral achenes about 3.2 cm long with pappus, about 1.6 cm long without pappus, weakly curved; body of achene about 1 cm long, indistinctly angular, weakly sculptured, gradually narrowed into slender, about 0.7 cm-long beak shorter than achene, and with tuft of soft hairs and apical swelling; pappus about 1.5 cm long, almost as long as achene with beak or shorter. Flowering July to August.

In alpine zone.—*Soviet Central Asia*: Pamiro-Alai (Alai Range, Pamir, Shugnan). *General distribution*: Indo-Himalayas. Described from India. Type in London.

- 151 23. **T. subalpinus** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937) 271.

Perennial or biennial. Root vertical, thick; root collar covered with remnants of previous year's leaves. Plants relatively small, 10–25 cm high, branched usually from base, caespitose. Stems slender, simple or branched, densely leafy. Leaves semiamplexicaul, broader in lower part, 5–10 mm wide, linear-lanceolate or linear (lower leaves), sometimes undulate, more or less incurved. Peduncles below capitula not thickened, slender, 1.5–3 mm wide. Capitula 1.5–2 cm long at flowering; 3–3.5 cm long at fruiting; involucre bracts (seven) eight, acuminate, lanceolate, almost as long as florets and achenes; florets pink-violet. Achenes with pappus 2.3 cm and without pappus 1.5 cm long; body of achene 0.9 cm long, almost smooth, weakly scabrous in upper part or entirely smooth, weakly sulcate, rather abruptly narrowed into about 0.6 cm-long smooth beak, slightly swollen at apex and without hairy annulus; pappus about 1.3 cm long, slightly shorter than achene with beak or almost as long. Flowering June to July; fruiting July to August.

Steppe slopes in alpine zone.—*Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan. *General distribution*: Dzhungaria-Kashgaria. Described from Dzhungarian Alatau. Type in Leningrad.

Note. It differs from *T. gracilis* D. Don by its involucre of eight bracts almost as long as the florets, pink-violet (dry) florets, shape of the leaves and achenes, as well as by its range.

Series 4. Purpurascens Boriss. Peduncles not or weakly thickened; florets purple or pinkish-violet; involucre bracts 8–12, almost as long as florets and achenes or slightly longer; plants biennial.

24. **T. sibiricus** Ganesch. in Tr. Bot. Muz. Akad. Nauk XIII (1915) 225; XVI (1916) 129; Kryl. Fl. Zap. Sib. XI, 2973; Popov, Fl. Sr. Sib. II, 72.—**lc.**: Ganeschin, op. cit., Plate XV.

Biennial. Root thickened above middle, vertical, long. Plant glabrous, light green, 45–110 cm high; stem erect, smooth, sometimes in upper part, as also leaves, reddish-violet. Leaves linear or broadly linear, broader at base, 4–8(13) mm wide, semiamplexicaul; lower leaves 20–35 cm long; middle cauline and upper leaves strongly ovately broadened at base and abruptly narrowed in upper part, 4–12(16) cm long. Peduncles weakly thickened below capitula, covered with ferruginous and black hairs. Capitula 15–20 mm long, at fruiting 30–50 mm long, solitary terminal on stem and branches. Involucre bracts 8(10), 1.5–3 cm long, almost as long as achenes; florets dark red or purple; peripheral florets two-thirds as long as involucre. Achenes with pappus about 4 cm long, without pappus about 2.3 cm long; body of achene smooth, roundish;

- 152 without sculpture, abruptly narrowed into smooth and slender 6.5–14 mm-long beak, slightly swollen at apex and with hairy annulus; pappus whitish, about 1.7 cm long, almost as long as achene with beak. Flowering June to July. (Plate VII, Fig. 3).

Meadows, river valleys, forest glades, open woodlands.—Western Siberia: Ob', Irtysh, Altai; *Eastern Siberia*: Angara-Sayans. Endemic. Described from Siberia. Type in Leningrad.

25. ***T. cretaceus*** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937), 446; Fl. Yugo-Vost. VI, 446; Stank. and Tal. Opređ. Vyssh. Rast. (1949) 688; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 2.

Biennial. Root vertical. Plants 15–35 cm high; stem slender, glabrous. Lower leaves narrowly linear, 2.5–5 mm wide, almost filiform at ends, often folded; middle leaves broadened, semiamplexicaul, (3)4–6 mm wide, with linear-lanceolate lamina, narrowed into filiform cusp; upper leaves reduced. Peduncles sometimes slightly thickened below capitula, 4–6 mm thick. Capitula narrowly cylindrical at flowering, 7–12(15) mm wide (dry), 2.5–3.5 cm long, up to 5.5 cm at fruiting; involucre bracts 8–12, filiform-acuminate, somewhat exceeding florets and achenes; florets pinkish-violet or purple; outer achenes almost straight, five-angled, squamose-scabrous, indistinctly sculptured in lower part, gradually narrowed into slender beak longer than achene; pappus dirty brown, much shorter than achene with beak. Flowering May.

On outcrops and chalky slopes.—*European Part*: Lower Volga (near Volsk). Endemic. Described from chalky slopes in vicinity of Volsk. Type in Leningrad.

Note. It is distinguished from *T. porrifolius* mainly by the narrow, conduplicate leaves, smaller capitula, involucre slightly exceeding the florets and achenes, and sculpture of the achenes.

Section 7. Tuberosi (Kuthath.) Boiss. comb. nova.—*Ser. Tuberosi* Kuthath. Kavk. Predst. Tragop. (1957) 25.—Peduncles slightly thickened or not below capitula; capitula medium, 2–4 cm long, solitary, on straight peduncles; involucre bracts eight, as long as florets or shorter, almost as long as outer achenes or shorter; florets yellow and pale yellow, sometimes somewhat lilac with brownish veins on drying; achenes narrowed into somewhat slender, straight beak, almost as long as brownish-squamose body of achene; perennial plants with tuberous roots.

Type of section: *T. tuberosus* C. Koch.

26. ***T. tuberosus*** C. Koch in Linnaea XXII (1849) 662; Grossh. Fl. Kavk. IV, 231; Kuthath. Kavk. Predst. Tragop. (1957) 31; Kuthath. in

- 153 Fl. Azerb. VIII, 506.—*T. pusillum* acut. non M.B.: Boiss. Fl. or. III (1875) 753, p. p.—**lc.**: Kuthath. in Fl. Gruzii VIII (1952) Fig. 428; Kuthath. op. cit. (1957) Plate III, Fig. 12, Map 5.—**Exs.**: Pl. or. exs. No. 99.

Perennial. Root mostly vertical, swollen at some depth as globose or cylindrical, sometimes elongated tuber; root collar sometimes covered with sheaths of dead leaves. Plants 20–40(45) cm high, glabrous or flocculose; stems erect. Basal leaves linear, long, numerous; cauline leaves 3–10 cm long, strongly broadened at base, five- to seven-veined, gradually narrowed, almost amplexicaul, sometimes weakly pubescent. Peduncles weakly thickened below capitula. Capitula large, 2–4 cm long at flowering, 4–5 cm long at fruiting; florets bright yellow, with four violet stripes on lower side, pale violet on drying. Involucral bracts eight, as long as ligulate florets or shorter, lanceolate, almost as long as achenes with pappus at fruiting. Peripheral achenes with pappus 3.7–4.3 cm long, without pappus 1.6–2.4 cm long; body of achene 1.1–1.4 cm long, tuberculate-squamose along ribs and deeply sulcate, gradually narrowed into ribbed, glabrous, about 1 cm-long beak, shorter than body of achene, with hairy annulus at apex; pappus 1.7–1.9 cm long, white or grayish, shorter than achene with beak; inner achenes narrower, indistinctly ribbed. Flowering April to May; fruiting May to June.

Dry stony slopes, among scrub up to upper mountain zone.—*Caucasus*: Ciscaucasia, Dagestan, Eastern Transcaucasia, Southern Transcaucasia. Endemic. Described from Georgia. Type was in Berlin.

27. **T. pusillus** M.B. Fl. taur.-cauc. III (1819) 521; DC. Prodr. VII, 115; Ldb. Fl. Ross. II, 789; Boiss. Fl. or. III, 753, p. p.; Grossh. Fl. Kavk. IV, 232; Borissova in Fl. Turkm. VI, 296—*T. pratense* β . *eriophorum* DC. Prodr. VII (1837) 113.—**lc.**: Kuthath. in Fl. Gruzii VIII, Fig. 430; Kuthath. Kavk. Predst. Tragop. (1957) Plate III, Fig. 13, Map 5.

Perennial. Root long, vertical, slender, swollen at some depth, as mostly oblong tuber, deep in soil; root collar covered with hairs or sheaths of previous year's leaves. Plants short, 5–15(25) cm high, loosely flocculose in lower part, glabrescent. Leaves numerous; basal leaves narrowly linear, slightly broadened at base, semiamplexicaul, densely pubescent, one- to three-veined, erect or slightly twisted and coiled at apex, furrowed, sometimes pubescent along margin; cauline leaves wider at base and shorter, oblong-lanceolate, long-acuminate. Peduncles one-headed, slightly exceeding leaves or as long, not thickened below inflorescence. Capitula 2–3 cm long. Involucral bracts eight, narrowly lanceolate, as long as florets or shorter; florets pale yellow, weakly lilac on drying with brownish veins in lower part. Achenes with pappus about

3 cm long, without pappus 1.6 cm, about 1 cm long excluding beak, about 1 mm wide in body of achene, scabrous, shallow-sulcate, gradually narrowed into slender, about 0.6 cm-long, rugose beak, sulcate and without hairy annulus at apex; pappus about 1.3 cm long, shorter than achene with apex; pappus about 1.3 cm long, shorter than achene with beak. Flowering April to May; fruiting May to June.

Dry slopes of hills, from desert to alpine zone.—*Caucasus*: Dagestan, Eastern and Southern Transcaucasia, Talysh; *Soviet Central Asia*: mountainous Turkmenia (Greater Balkhans Range). *General distribution*: Iran. Described from Azerbaidzhan and from eastern Georgia. Type in Leningrad.

Section 8. Profundisulcati Kuthath. Kavk. Predst. Tragop. (1957) 49, p. p.—Peduncles not thickened below capitula or slightly thickened; capitula large; involucre bracts often 5, less often 10–12, very rarely 5, longer or shorter than florets; florets yellow; body of achene with five deep furrows and five prominent, sometimes winged squamose ribs, abruptly narrowed into slender beak; pappus not longer than achenes; plants biennial.

Type (lectotype) of section: *T. armeniacus* Kuthath.

Series 1. Subobconico-pedunculati Kuthath. Kavk. Predst. Tragop. (1957) 51 p. p.—Peduncles not or weakly thickened below capitula; involucre bracts 8, less often 10–12, shorter than florets; florets yellow; beak as long as body of achene; pappus mostly shorter than or as long as achenes.

28. *T. meskheticus* Kuthath. in Zam. po Sist. i Geograf. Rast. Tbil. 17 (1953) 34; Fl. Gruzii VIII, 627; Kuthath. Kavk. Predst. Tragop. (1957) 51.—*lc.*: Kuthath. op. cit. (1957) Plate VII, Fig. 23 (incorrect), Map 9.

Perennial. Root vertical, cylindrical, long; root collar without old leaves. Plants glaucous or flocculose and spinescent. Stems numerous, branched, whitish, densely leafy up to apex. Basal leaves broadly linear, long, glaucous; cauline leaves gradually broadened at base, long-acuminate; uppermost leaves broadly lanceolate, short-acuminate. Capitula rather small. Peduncles not thickened below capitula or weakly thickened at fruiting; florets yellow or pale yellow; involucre bracts eight, lanceolate, as long as or slightly longer than achenes with pappus, recurved on fruiting. Peripheral achenes flat, white, deeply furrowed, acutely tuberculate-squamose along ribs, abruptly narrowed into beak, longer than body of achene; achenes shallow-sulcate, finely tuberculate, with shorter beak; beak with white hairy annulus at apex; pappus shorter than achene with beak. Flowering July; fruiting August.

155 On saline soils in lower mountain zone.—*Caucasus*: Eastern Transcaucasia (Meskhetia). Endemic. Described from Meskhetia. Type in Tbilisi. Cotype in Leningrad.

Note. Description of achenes taken from Kuthatheladze (1957), where, however, the illustration (Plate VII, Fig. 23) does not correspond with the characters of the species described in the text.

29. ***T. ketzkhovelii*** Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 16 (1951) 96; Kuthath. Fl. Gruzii VIII, 628; Kavk. Predst. Tragop. (1957) 52.—*T. reticulatus* var. *latifolius* Sosn. ex Kuthath. op. cit. (1951) 98.—**lc.:** Kuthath. op. cit. (1951) 97, Fig. 1; op. cit. (1957) Plate VIII, Fig. 27, Map 9.

Biennial. Root vertical, cylindrical; root collar often covered with remnants of dead basal leaves. Plants almost glabrous, 30–55 cm high, with erect, thick stems, simple or branched from base, angular in cross section. Basal leaves long, almost half as long as plant, linear, not broadened at base; cauline leaves basally broadened, gradually narrowed, acuminate. Capitula large, solitary. Peduncles long, far exceeding leaves, not thickened below capitula; involucre bracts eight, lanceolate, slightly pubescent at base, almost as long as achenes with pappus or slightly shorter; florets yellow, as long as involucre bracts or slightly longer. Peripheral achenes with pappus 5.5 cm long, without pappus 2.5 cm long; body of achene 1.3 cm long, about 2.5 mm wide, grayish, deeply sulcate, winged, with five prominent winged ribs covered with upright, short, denticulate spinules, abruptly narrowed into straight, somewhat slender grayish beak almost as long as body of achene, about 1.2 cm long, scabrous and finely sulcate below, slightly swollen at apex and with hairy annulus; pappus about 2.5 cm long, with isolated nonplumose hairs, up to 3.2 cm long, light golden-yellow; inner achenes almost indistinguishable from peripheral. Flowering June to August.

Mountain slopes of the middle mountain zone in more or less xerophytic habitats.—*Caucasus*: Southern Transcaucasia (Armenian uplands and Dzavakhetia). Endemic. Described from Dzavakhetia in vicinity of village of Kumurdo. Type in Tbilisi.

30. ***T. plantagineus*** Boiss. and Huet in Boiss. Diagn. pl. or. ser. II, 3 (1856-1859) 91; Kuthath. Kavk. Predst. Tragop. (1957) 53.—*T. buphtalmoides* α. *latifolius* Boiss. Fl. or. III, 751; Grossh. Fl. Kavk. IV, 233.—*T. brevifolius* C. Koch in Linnaea XXIII (1850) 662.—**lc.:** Kuthath. op. cit. Plate VIII, Fig. 26, Map 9.

Biennial. Plants up to 70 cm high; root vertical; cylindrical; root collar covered with few hairs. Stems cylindrical, simple, sometimes branched above, with straight branches. Basal leaves oblong-broadly

156 lanceolate, 8–10 cm long and (11)20–30 cm wide; cauline leaves reduced, very short at forks, short-acuminate, recurved. Peduncles slightly thickened below capitula. Capitula narrow in beginning of flowering, later broadening; florets yellow. Involucral bracts eight, shorter than achenes with pappus. Peripheral achenes whitish-grayish, large, with five deep furrows and five prominent winged ribs, abruptly narrowed into beak almost as long as body of achene; inner achenes with shallow furrows, acutely squamose, gradually narrowed into somewhat thick beak; pappus dirty gray, with hairy annulus at base. Flowering V–VI; fruiting VI–VII.

Mountain slopes.—*Caucasus*: Southern Transcaucasia (Armenia). *General distribution*: Asia Minor. Described from vicinity of Erzurum. Type in Geneva.

31. *T. buphtalmoides* (DC.) Boiss. Fl. or. III (1875) 750; Grossh. Fl. Kavk. IV, 233; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 3; Kuthath. Kavk. Predst. Tragop. (1957) 54.—*T. buphtalmoides* β . *stenophyllum* Boiss. op. cit. 751.—*T. persicum* Boiss. Diagn. pl. or. ser. I, 7 (1846) 4; Boiss. Fl. or. III, 751; in syn. Grossh. op. cit.—*Scorzonera buphtalmoides* DC. Prodr. VII (1838) 121.—*Id.*: Kuthath. op. cit. Plate VIII, Fig. 28, a (incorrect), Map 9.

Perennial or biennial. Root vertical, cylindrical; root collar often covered with previous year's leaves. Plants 40–70 cm high, flocculose; stems rather densely leafy, erect, simple or branched from base. Basal leaves linear or lanceolate, up to 25 cm long, 7–8 mm wide, usually seven-veined, often withering during flowering; cauline leaves linear, shorter, gradually narrowed toward apex; upper cauline leaves reduced, 2–2.5 cm long, broadened at base, semiamplexicaul, short-acuminate, with distinct longitudinal veins. Peduncles at fruiting slightly thickened below capitula, smooth or pubescent. Capitula large; florets yellow. Involucral bracts 8–10(12), often tomentose near base, shorter than achenes and florets, sometimes incurved at fruiting. Peripheral achenes with beak about 5.3 cm long, without pappus about 2.3 cm long; body of achene about 1.5 cm long, deeply five-furrowed and obtusely ribbed or winged, dentate-squamose along ribs, abruptly narrowed into somewhat thick, finely sulcate, about 0.6 cm-long beak, swollen at apex and with hairy annulus; pappus about 3 cm long, lustrous, golden or grayish-golden; inner achenes almost smooth and terete, shallow-ribbed, gradually narrowed into beak. Flowering May to June; fruiting June to July.

Dry stony and cobbly slopes, in maple-juniper woodlands in middle and upper mountain zones.—*Caucasus*: Southern Transcaucasia, Talysh. *General distribution*: Balkans-Asia Minor, Armenia and Kurdistan, Iran. Described from northern Syria. Type in Paris.

Note. A polymorphic plant; vars. *stenophyllus* Boiss. and *humilis* Boiss. are distinguished on the basis of leaf width and plant height.

- 157 32. **T. tasch-kala** Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 17 (1953) 38; Kuthath. Kavk. Predst. Tragop. 2 (1957) 55.—**lc.**: Kuthath. op. cit. (1957) Plate VII, Fig. 24, Map 9.

Biennial. Root vertical, cylindrical; root collar often covered with dry leaves. Plants flocculose, 30–50 cm high. Stems cylindrical, whitish, branched from base or middle, densely leafy, with one capitulum each at branch apices. Basal leaves linear, weakly broadened toward base, gradually narrowed toward apex, up to 15 cm long, not longer than stem; cauline leaves dense, numerous, reduced, 4–6 mm long, lanceolate, broadened at base to 7–10 mm, semiamplexicaul, gradually narrowed toward apex. peduncles longer than leaves, slightly thickened at fruiting, fistular, glabrous or tomentose at base of capitula. Capitula large, up to 4.5 cm long at fruiting; florets yellow, much longer than involucre bracts. Involucre bracts 12, lanceolate, whitish, involute (dry), shorter than florets and achenes with pappus. Peripheral achenes about 4.5 cm long, excluding pappus about 2.3 cm long, slightly curved; body of achene excluding beak about 1.5 cm long, sulcate-furrowed, with five prominent acutely squamose winged ribs and with five small furrows, with erect scales, nonsquamose below, rather abruptly narrowed into 0.8 cm-long, slender, sulcate beak, swollen at apex and with hairy annulus; pappus yellowish, about 2 cm long; inner achenes slightly longer than peripheral ones. Flowering July.

In subalpine zone, at about 1,750 m.—*Caucasus*: Southern Transcaucasia. Endemic. Described from Armenia (Karabari, Tashkala). Type in Tbilisi; isotype in Leningrad.

33. **T. karjagini** Kuthath. Kavk. Predst. Tragop. (1957) 57; Fl. Azerb. VIII, 511.—**lc.**: Kuthath. op. cit. Plate IX, Fig. 29 (incorrect), Map 10.

Biennial. Root vertical; root collar often covered with previous year's leaves. Plants glabrous, glaucous. Stems branched from base, whitish, up to 60 cm high. Basal leaves longer than cauline leaves; cauline leaves broadened at base, finely and long-acuminate, semiamplexicaul, remote. Peduncle weakly thickened below capitula, fistular. Capitula large. Involucre bracts eight, shorter than achene with pappus; florets unknown. Peripheral achenes about 3.5 cm long, slender, abruptly narrowed into beak, rather deeply narrow-sulcate, with 10 ribs, white squamose along ribs, curved, convex in middle or below, grayish; inner achenes ferruginous, shallow-sulcate, flatter and squamose, almost smooth, especially in lower part, with beak as long as or slightly longer than

body of achene, hairy (?) at apex below pappus; pappus about 1.7 cm long, shorter than achene with beak. Flowering May to June; fruiting June to July.

- 158 Stony slopes of lower mountain zone.—*Caucasus*: Eastern Transcaucasia (Azerbaijan). Endemic. Described from the vicinity of Dzhebrail. Type in Baku.

Series 2. Latifolii Kuthath. Kavk. Predst. Tragop. (1957) 44.—Peduncles not thickened below capitula; involucre bracts 8–10 or 10–12, shorter than ligulate florets; outer achenes with five more or less deep furrows and five ribs, gradually narrowed into beak, shorter than achenes; florets yellow.

34. **T. latifolius** Boiss. Diagn. pl. or. ser. I (1844) 23; Boiss. Fl. or. III, 750; Sosn. in Tr. Azerb. Otd. Zakavk. Fil. Akad. Nauk SSSR, I, 48; Grossh. Fl. Kavk. IV, 232; Kuthath. Kavk. Predst. Tragop. (1957) 44, Map 8; Fl. Azerb. VIII, 509.

Biennial. Root straight, long, slender or thick, but not tuberous. Plants 50–60 cm high; stems erect, robust, angular, simple, or, mainly in upper part, weakly branched, densely leafy, finely sulcate, glabrous, flocculose below; internodes short. Leaves oblong or broadly lanceolate, 2–4 cm wide, abruptly narrowed toward apex, semiamplexicaul near base, entire and weakly undulate, 8–12-veined; upper leaves shorter, lanceolate, glabrous or appressed hairy. Peduncles not thickened below capitula, considerably exceeding leafy part of stem. Capitula solitary, rather large, 3–4 cm wide; florets yellow, exceeding involucre; involucre bracts 10–12, wide, lanceolate, long-acuminate, shorter than outer florets, flocculose at base at flowering. Outer achenes with five more or less deep furrows, squamose-tuberculate, gradually narrowed into beak much shorter than achenes; pappus whitish or dirty white, shorter than achenes with beak. Flowering May to June; fruiting June to August.

Subalpine and alpine meadows and forest edges at 2,000–2,400 m, sometimes in crops.—*Caucasus*: Eastern and Southern Transcaucasia. *General distribution*: Balkans-Asia Minor. Described from Asia Minor. Type in Geneva.

Note. Figure 20 in Plate VI in the work of Kuthatheladze (1957) is not correct.

35. **T. acanthocarpus** Boiss. Diagn. pl. or. I, 11 (1849) 45; Boiss. Fl. or. III, 751, p. p.; Grossh. Fl. Kavk. IV, 232; Kuthath. Kavk. Predst. Tragop. 48; Kuthath. in Fl. Azerb. VIII, 509.—**Ic.**: Kuthath. op. cit. (1957) Plate VI, 19, Map 8.

Biennial. Root robust, vertical; root collar covered with fibrous sheaths of previous year's leaves. Plants glabrous or slightly flocculose,



up to 60 cm high; stem slender, erect, cylindrical, simple or weakly branched above, whitish, finely sulcate, leafy, with short internodes. Basal leaves narrow, long, linear, finely and long-acuminate, usually folded, glabrous, withering at flowering; cauline leaves shorter, expanded
 159 in lower part, up to 10–13 mm, amplexicaul, subulately acuminate, usually five-veined. Peduncles not expanded below capitula, glabrous or flocculose. Capitula rather large, about 2.5 cm wide and 3 cm long. Involucral bracts 8–10, lanceolate, two-thirds as long as peripheral florets, about 2 cm long, erect, broadened toward base; florets yellow. Peripheral achenes 3.5–4.5 cm long, excluding pappus, 2–2.5 cm long, 1.5 mm wide, sharply five-angled, along margin acerose and verrucose or finely squamose, shallow-sulcate, with more or less distinct, distant, acute, erect, curved spinules along ribs; body of achenes gradually narrowed into about 1 cm-long, sulcate beak, somewhat slender, swollen at apex, and with hairy annulus, less than half as long as achene; pappus about 1.7–2 cm long, dirty white or grayish, slightly shorter or almost as long as achene with beak. Flowering June to July; fruiting July to September.

Dry slopes in subalpine and alpine zones, at 1,900–2,400 m.—*Caucasus*: Eastern Transcaucasia (Nakhichevan), Southern Transcaucasia. Talysh. *General distribution*: Iran. Described from Tochal Mountain in vicinity of Tehran. Type in Geneva; isotype in Leningrad.

36. **T. idae** Kuthath. Kavk. Predst. Tragop. (1957) 46.—**lc.**: Kuthath. op.cit. Plate V, Fig. 17 (incorrect), Map 8.

Biennial. Root vertical, cylindrical, thick, but not tuberous. Plants glaucous-green, up to 50 cm high; root collar often with few fibrous remnants of previous year's leaves. Stems erect, branched almost from base or middle, glabrous, cylindrical, leafy. Cauline leaves 2–5 cm long, 1.5 cm wide, lanceolate, briefly narrowed at apex, roundish or weakly acuminate. Peduncles below capitula slightly expanded or not, glabrous. Capitula large. Involucral bracts eight, narrowly lanceolate, white-membranous along margin, shorter than florets and achenes with pappus; florets yellow. Peripheral achenes with beak up to 3 cm long, with five shallow furrows and five white, squamose, obtuse ribs; beak as long as body of achenes, clavately thickened at apex, with hairy annulus; pappus yellowish, lustrous, slightly shorter than achene with beak. Flowering August.

Mountain meadows.—*Caucasus*: Southern Transcaucasia (Armenia, Daralagyo District). Endemic. Described from Armenia. Type in Tbilisi.

Note. It differs from *T. acanthocarpus* Boiss. by the shape and size of its leaves, structure of the outer achenes, ratio of beak length to broadest part of the achene, and general appearance.

37. **T. makaschwili** Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil.

17 (1953) 33; Kuthath. in Fl. Gruzii VIII (1952) 628; Kavk. Predst. Tragop. (1957) 47, Map 8.—*T. elatior* auct. non Stev.: Grossh. Oprod. Rast. Kavk. (1949) 506.—**Ис.:** Kuthath. op. cit. (1953) Fig. 3.

160 Biennial. Root vertical, cylindrical; root collar covered with fibrous remnants of dead leaves. Stem solitary, cylindrical, erect, sparsely leafy, with indistinct nodes, finely sulcate. Leaves lustrous, dark green, semiamplexicaul; basal and lower cauline leaves almost similar, linear or broadly linear, 25–30 cm long, about 1.5 cm wide; uppermost leaves reduced, 2–3.5 cm long, expanded at base, lanceolate, gradually attenuate and long-acuminate. Peduncles below capitula slightly or practically not thickened. Capitula solitary, large, 3.5 cm long, about 3.5 cm wide; florets yellow, with light blue stripes on drying. Involucral bracts 10, lanceolate, glabrous, about 3 cm long, shorter than florets. Achenes unknown. Flowering August.

In crop fields of the lower mountain zone.—*Caucasus*: Eastern Transcaucasia (Akhalkalaki District) and Southern Transcaucasia. Endemic. Described from Georgia. Type in Tbilisi; isotype in Leningrad.

Series 3. Armeniaci Boriss. Peduncles not or slightly thickened below capitula at fruiting; involucral bracts five, shorter than achenes; outer achenes sulcate, with five prominent winged ribs, abruptly terminating in thick sulcate beak, with hairy annulus at apex; pappus yellowish.

38. **T. armeniacus** Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 17 (1953) 36; Kuthath. Kavk. Predst. Tragop. (1957) 56, Map 9.—**Ис.:** Kuthath. op. cit. (1953) Fig. 5; op. cit. (1957) Plate VII, Fig. 25.

Root cylindrical, vertical; root collar without previous year's leaves. Plants glabrous, up to 45 cm high. Stems cylindrical, erect, simple or branched above, with single capitulum at branch apices. Basal leaves narrowly linear, folded; cauline leaves shorter, expanded at base, semiamplexicaul, folded. Peduncles below capitula not or weakly thickened at fruiting, glabrous or covered with very short, appressed yellowish hairs. Capitula at fruiting large. Involucral bracts five, lanceolate, gradually long-acuminate, shorter than achene with pappus, less often as long; florets purple(?). Peripheral achenes large, about 4 cm long with pappus, without pappus 1.9 cm; body of achenes 1.2 cm long, 4 mm wide, sulcate, with five prominent winged ribs with sharp dentate margin and five indistinct, sharply dentate ribs in between, abruptly narrowed into thick, sulcate, about 0.6 cm-long beak, slightly swollen at apex and with hairy annulus; pappus about 2.3 cm long, yellowish. Flowering June; fruiting July.

162 In subalpine zone, at 2,000 m.—*Caucasus*: Southern Transcaucasia (former Artik District). Described from Armenia. Type in Tbilisi; isotype in Leningrad.

Section 9. *Bessera* Boiss. sect. nov. in Addenda XXVIII, 724.—Peduncles not thickened below capitula, scarcely exceeding leaves; capitula mostly small and medium; involucre bracts (seven) eight or 8–12, shorter than florets and achenes; florets yellow or pale yellow; achenes slender, flat, smooth or weakly scabrous, narrowed into indistinct, 1.5–3 mm long beak; pappus slightly shorter than achene; plants perennial (less often biennial) flocculose, especially at flowering, sometimes caespitose, simple or branched, densely leafy; root collar covered with fibrous remnants of old leaves; leaves narrow to filiform. On sands.

Type of section: *T. lithuanicus* (DC.) Boriss.

Note. Is distinguished from the species of section *Breviostres* Kuthath. by the caespitose habit, number of involucre bracts (8–12 and not five to eight), and shape of the achenes; achenes slender, flat and elongated, mostly smooth, with an indistinct beak and a pappus shorter than the achene; in the species of section *Breviostres*; achenes shallow-sulcate, tuberculate-scabrous with a distinct, short beak.

Series 1. *Lithuanici* Boriss. ser. nov. Perennial prostrate plants with numerous creeping vegetative branches, forming turf; involucre bracts eight; capitula rather small; florets light yellow; achenes about 2.3 cm long, almost smooth, with indistinct, about 3 mm-long, somewhat thick beak; pappus shorter than achene.

39. ***T. lithuanicus* (DC.) Boriss.** comb. nova.—*T. breviostre* δ . *lithuanicum* DC. Prodr. VII (1838) 114; Ldb. Fl. Ross. II, 1 (1844) 788.—*T. floccosus* subsp. *lithuanicus* (Bess.) C. Rgl. in Ser. Hort. Bot. Univ. Vyt. Magni V (1937) 43; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Map 1.

Perennial. Root virgate, robust; rhizome branched, bearing numerous prostrate vegetative branches, forming dense turf. Stems short, fertile, 5–10 cm long, densely white-flocculose-arachnoid, glabrous at fruiting, simple or branched, densely leafy. Basal leaves filiform and narrowly linear, 3–8 cm long, 0.5–1 mm wide, sparsely flocculose-arachnoid; middle and upper leaves abruptly acuminate from oblong-ovate or lanceolate base to narrowly linear apex, sometimes deflexed, 7–30 mm long, 1–3.5 mm wide at base, flocculose-arachnoid, especially at leaf base. Involucre bracts eight, 2.5–4 mm wide, 12–22 mm long at base, linear-lanceolate, thin-acuminate, densely flocculose-arachnoid at flowering. Peduncles slightly exceeding leaves, glabrous. Florets light
163 yellow, peripheral florets slightly exceeding involucre. Achenes with pappus about 2.3 cm long, without pappus 13–15 mm long, fusiform, body of achene 10–13 mm long, smooth or weakly scabrous and finely

sulcate, in upper part gradually narrowed into less distinct, about 3 mm-long beak; pappus shorter than achene, 10–14 mm long. Flowering July to August.

On sands.—*European Part*: Baltic Region (Lithuania). Described from Lithuania (Rukhcha). Type in Kiev; isotype in Leningrad.

Note. A unique plant, not collected again by anyone; apparently a rare relict.

Series 2. Heterospermi Boriss.—Perennial(?) branched plants; involucre bracts (7)8–12; capitula 2.5–3.5 cm long; florets yellow or light yellow, exceeding involucre bracts; achenes with pappus 2.5–3.5 cm long, thin, smooth or finely squamose, scabrous along ribs, gradually and smoothly narrowed toward apex; beak not developed; pappus shorter than achene.

40. *T. gorskianus* Rchb. Ic. Fl. Germ. XIV (1860) 19, t. 43; Artemcz. in Tr. Inst. Bot. khar'k. Univ. II, 31; Stank. and Tal. Oprod. Vyssh. Rast. 690; C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 47; Berichte Schweiz. Bot. Gesellsch. 65 (1955) Map 1.—*T. floccosus* subsp. *heterospermus* var. *gorskii* C. Rgl. l. c. (1955) 252.

Perennial(?). Root long, fusiform, vertical; root collar covered with remnants of old leaves. Stem branched, ascending. Basal leaves narrower than cauline leaves, 2–5 mm wide. Involucre bracts longer than florets; florets yellow, shorter than involucre. Peripheral achenes smooth, with beak as long as body of achene; pappus pale brown. Flowering June(?).

On sands.—*European Part*: Baltic Region (vicinity of Druskenikai in Lithuania, Neman River). Endemic. Described from Lithuania. Type unknown.

Note. I did not have at my disposal material for this species.

It is distinguished from *T. floccosus* Waldst. and Kit., with which it is synonymized, by size of stem, ratio of beak and achene length, and length of achene. From *T. bjelorussicus* Artemcz. it differs by the relationship of the length of the beak and the achene and by yellow florets that are shorter than the involucre bracts; from *T. orientalis* it differs by having smooth achenes.

41. *T. tanaiticus* Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 51; Klok. in Vozn. Rosl. 591.—*T. ruthenicus* auct. non Bess.: S. Nikit. in Majevski, Fl. (1933) 705; Nikit. in Izv. Glavn. Bot. Sada SSSR, XXIX, 5–6, 487, ex. p.—*T. ruthenicus* subsp. *tanaiticus* (Artemcz.) C. Rgl. Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 44; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Map 2.—**Ic.**: Artemcz. op. cit. Fig. 7; C. Rgl. op. cit. Abb. 8, 19.

164 Perennial(?). Root robust, vertical; root collar covered with remnants of old leaves. Plant 15–75 cm high, more or less densely flocculose-arachnoid, especially below capitula. Stems solitary or few, branched, rather densely leafy. Upper leaves reduced, 1.5–5 cm long, not convolute, expanded at base up to (4)8–12 mm, abruptly narrowed into linear, 2–5(8) mm wide lamina, acute; cauline leaves 8–10(16) mm wide at base, toward apex sometimes curved or involute, gradually narrowed; basal leaves narrower than cauline leaves, narrowly linear, expanded at base, whitish-lilac, folded, acute. Involucral bracts (seven) eight, shorter than florets, narrowly lanceolate, 18–25 mm long, at fruiting (4)8–10 mm wide, narrowly membranous along margin, usually pubescent, sometimes alternating with less pubescent bracts, glabrescent. Capitula medium; peduncles below capitula not thickened; florets yellow. Peripheral achenes five-angled, thin, 2.5 cm long with and 1.3–1.5 cm long without pappus, sulcate, finely squamose, scabrous along ribs, slightly narrowed toward apex, beak not developed; pappus 9–10 mm long, grayish, shorter than achene, with hairy annulus near base; inner achenes smooth, with pappus about 2.8 cm long. Flowering June to August.

Sands in steppe and forest-steppe zone in the middle reaches of the Don and Volga.—*European Part*: Middle Dnieper (Kharkov), Volga-Don, Lower Don, Lower Volga. Endemic. Described from Voronezh Region (village of Berez-nyagi). Type in Leningrad.

Note. It is distinguished from *T. ruthenicus* (C.A.M.) Bess. by shorter, more compact leafy stems, narrower leaves, thinner, curved, five-angled, and less scabrous achenes, and a longer pappus. From *T. floccosus* Waldst. and Kit. it differs by the absence of the beak.

42. ***T. heterospermus*** Schweigg. in Koenigsb. Arch. Naturw. I (1812) 229; Hagen, Chloris Borussica (1818) 145; *ibid* (1819) 288; S. Nikit. in Izv. Glavn. Bot. Sada SSSR XXIX, 5–6, 490; Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II, 33.—*T. brevirostre* δ . *floccosum* (Waldst. and Kit.) Schmalh. Fl. II (1897) 147.—*T. floccosus* subsp. *heterospermus* (Schweigg.) C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 42; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 1.—**Ic.**: Rchb. Ic. Fl. Germ. XIX, 1 (1860) 19, t. 41.—**Exs.**: GRF Nos. 332, 3799.

Perennial(?) or biennial. Root vertical, long, cylindrical; root collar covered with fibrous remnants of old leaves. Plants 20–50 cm high, lanate-tomentose, sometimes mainly in lower parts; stem usually branched from base, densely leafy. Leaves not exceeding stem; lower leaves linear, expanded at base, often folded; cauline leaves amplexicaul, expanded at base, 4–10 mm wide, 3–10 cm long, narrowed upward, not deflexed, subulate; upper leaves reduced, 4–5 mm wide at base, 10–15 mm long,

gradually subulately acuminate, sometimes more or less incurvate. Peduncles not thickened below capitula. Capitula numerous, solitary terminal on branches, 3–4 cm long. Involucral bracts 8–12, at flowering 165 23–30 mm long, shorter than florets and achenes, lanceolate, acuminate, with elongated cusp; florets pale yellow, exceeding involucral bracts. Peripheral achenes with pappus 2.5–3.5 cm long, without pappus 1.3–1.6 cm, about 1 mm wide, sulcate, five-ribbed, finely tuberculate or almost smooth, almost without or with weakly developed, about 2–3 mm-long beak, one-sixth to one-fifth as long as body of achene; pappus about 1.5 cm long, yellowish, with short hairy annulus at base. Flowering May to August. (Plate VII, Fig. 1.)

Sand dunes.—*European Part*: Baltic Region (near Riga, in Lithuania, Kaliningrad Region). Endemic. Described from Baltic Region. Topotype in Leningrad.

Note. It differs from *T. floccosus* Waldst. and Kit. by plant size and by having more densely lanate-tomentose pubescence, numerous flat, usually less reduced cauline leaves, larger capitula and achenes, and a separate range. From *T. bjelorusasicus* Artemcz. it differs by having broader achenes, shorter involucral bracts and achenes with a shorter beak. C. Regel (op. cit.) recognizes var. *maritimus* C. Rgl. on the sandy shores of the Baltic Sea and var. *heidenreichii* Abromeit (*Fl. Ost-West-preussen* (1903) 466) in the Kaliningrad Region, which differ by having achenes with a distinct beak, an almost complete absence of pubescence, green, glabrous stems, and a height of about 30 cm.

Section 10. *Breviostres* Kuthath. Kavk. Predst. Tragop. (1957) 12, p. p.—Peduncles not thickened below capitula; capitula small to medium, on erect, long peduncles; involucral bracts (five) six to eight, shorter than ligulate florets; florets yellow, sometimes pale lilac with violet veins on drying; achenes shallow-sulcate, tuberculate-squamose or smooth, distinctly narrowed into short beak or beak indistinct; pappus almost as long as achene with beak. Plants perennial and biennial, not caespitose; root collar covered with fibers or old dead leaves.

Type of section: *T. dasyrynchus* Artemcz.

Series 1. *Dasyrhynchiformes* Artemcz. in Uch. Zap. Chernov. Univ. I (1948) 89, p. p.; Kuthath. Kavk. Predst. Tragop. (1957) 22, p. p.—Florets yellow; involucral bracts mostly eight, less often five, shorter than florets; achenes short, with short beak, mostly with hairy annulus at apex or glabrous; capitula 1.5–2.5 cm long. Plants biennial predominantly of steppe zone.

43. ***T. dasyrynchus*** Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 42; Klok. in Vozn. Rosl. URSR, 590; Grossh. Oprel. Rast. Kavk.

506; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) 252, Karte 2.—*T. brevirostre* auct. nonnul. non DC.: Boiss. Fl. or. III (1875) 752 and others; Schmalh. Fl. II, 147, ex parte.—*T. elatior* auct. nonnul. 166 non Stev.: Grossh. Opred. Rast. Kavk. 506, p. p.— *Ic.*: Artemcz. op. cit. Fig. 4; Kuthath. Kavk. Predst. Tragop. (1957) Plate II, Fig. 8, Map 2.

Biennial. Roots relatively slender, easily pulled out. Plants 25–130 cm high, glabrous or weakly pubescent, or flocculose-arachnoid-tomentose near leaf base and below capitula; root collar usually covered with hairs. Cauline leaves 5–16(35) mm, upper ovate-lanceolate, semi-amplexicaul, wider, more reduced at base, narrowed upward in flat lamina with undulate margin, recurved at apex; basal leaves linear, 5–13 mm wide, often folded. Involucral bracts (seven) eight, shorter than florets. Peduncles not thickened below capitula. Florets yellow; anthers blackish. Peripheral achenes about 2.7 cm long with pappus, shallow-sulcate, acutely squamose-tuberculate near base, gradually narrowed into scabrous, somewhat thick, 1–5 mm-long beak, one-fifth to half as long as achene; pappus about 1.7 cm long, almost as long as achene with beak, whitish, easily detached, with hairy annulus at base. Flowering May to August.

Dry steppe slopes, dry meadows in steppe and forest-steppe zone, scrubs and on river sands, in mountains on dry and stony slopes up to lower zone.—*European Part*: Black Sea Region, Crimea, Lower Don; *Caucasus*: Ciscaucasia (western). Endemic. Described from former Don Region. Type in Kiev.

Note. According to Artemczuk, *T. dasyrhynchus* Artemcz. is a xerophytic, primarily steppe species closely related to *T. ruthenicus* (C. A.M.) Bess., *T. donetzcicus* Artemcz. and *T. borystenicus* Artemcz., forming a series of vicariant species. I am referring *T. borystenicus* to series *Stepposi* Boriss., and *T. ruthenicus* and *T. donetzcicus* to section *Dubjanskya* Boriss., which encompasses the psammophilous, beakless species.

44. *T. volgensis* S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12 (1937) 261; Nikit. in Fl. Yugo-Vost. VI, 444.—*T. brevirostre* var. *volgense* S. Nikit. in Majevski, Fl. 6th ed, (1933) 706.—*T. brevirostris* subsp. *volgensis* C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 40; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 1.— *Ic.*: Rgl. Ibid. Abb. 3, 13.

Biennial. Root vertical, thickened in upper part; root collar covered with fibrous remnants of previous year's leaves. Plants light green, 20–60 cm high; stems few or solitary, simple or branched in lower part. Lower leaves numerous, as also other leaves, not exceeding stems, linear, herbaceous, without prominent veins, sometimes with whitish stripe in middle; and upper cauline leaves slightly expanded at base,

semiamplexicaul, 3–8(10) mm wide, linear or linear-lanceolate. Peduncles not thickened below capitula. Capitula elongated at fruiting, narrow, 0.8–1.5 cm wide, 18–25(30) mm long. Involucral bracts five to eight, shorter or almost as long as peripheral florets, shorter than achenes, linear-lanceolate, acuminate; florets yellow. Peripheral achenes with
 167 pappus about 2.8 cm long, excluding pappus 1.0–1.3(1.4) cm long, indistinctly obtusely angular, shallow-sulcate, finely tuberculate along ribs, gradually narrowed into about 0.4 cm-long, sulcate beak, not swollen at apex and with hairy annulus; pappus about 1.2 cm long, isolated pappus hairs up to 1.5 cm long. Flowering May to August; fruiting July to September. (Plate X, Fig. 1.)

Meadows and sands.—*European Part*: Volga-Don, Trans-Volga Region, Lower Volga; *Soviet Central Asia*: Aralo-Caspian Region. Endemic. Described from floodplain meadows of Volga near Astrakhan. Type in Leningrad.

Note. The florets were described from specimens collected in the Volga meadows near Syzran. The species differs from *T. podolicus* Bess. by the elongated capitula, number of involucral bracts (five to eight and not eight), size and sculpture of the achenes, and the relationship of the length of the achene, pappus and beak.

45. *T. podolicus* (Bess. ex. DC.) Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 34; Klok. in Vizn. Rosl. URSR, 590.—*T. podolicus* Bess. ex DC. Prodr. VII (1838) 114, pro syn.—*T. podolicum* auct. nonn.: S. Nikit. in Fl. Yugo-Vost. VI, 444, p. p.—*T. brevirostre* DC. γ. *podolicum* DC. l. c.; Ldb. Fl. Ross. II, 788; Schmalh. Fl. II, 147 ex p.—*T. brevirostris* subsp. *podolicus* var. *pratensis* C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 39.—*T. brevirostris* subsp. *podolicus* C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 1.—**lc.**: Artemcz. op. cit. Fig. 2; C. Rgl. op. cit. (1955) Abb. 1, 12.

Biennial. Root vertical, fusiform; root collar covered with remnants of old leaves. Plant glabrous or grayish, more or less weakly flocculose-tomentose, 25–90 cm high, strongly branched from middle; stems solitary or sometimes numerous, usually erect. Lower leaves linear, 10–25(35) cm long, 3–8(14) mm wide, usually with prominent veins; middle cauline leaves expanded at base, amplexicaul to middle, gradually narrowed upward, acuminate, flat or sometimes folded and pubescent, with obtuse callose thickening; upper leaves short, relatively broad, lanceolate-linear, finely and long-acuminate, sometimes apically contorted. Peduncles not thickened. Capitula numerous, at fruiting 20–30 mm long, in panicles at branch apices. Involucral bracts eight, lanceolate, acuminate, 15–20 mm long, shorter than florets and achenes; florets light yellow, peripheral florets slightly exceeding involucral bracts. Peripheral achenes smooth,

indistinctly obtusely ribbed, without sculpture, indistinctly squamose-scabrous at base, less often with indistinct sculpture; better developed achenes, acicular, with pappus about 1.8 cm long, gradually narrowed into beak, achenes 1.2 cm long without pappus, about 1 mm wide, with short 3–4 mm-long beak; pappus easily detached, shorter than achenes, about 0.8 cm long, with soft hairy annulus at base and slightly thickened. Flowering May to August.

Found infrequently along forest edges, in forest-steppe and steppe zones, dry meadows, on roadsides, less often in crops and on clayey-sandy substrates; in south, exclusively in meadows.—*European Part*: Upper Dnieper, Middle Dnieper, Volga-Don, Bessarabia, Black Sea Region, Lower Don. *General distribution*: Possibly, in Central Europe. Described from Podolia. Type in Kiev; isotype in Leningrad.

Note. Var. *floccosiformis* Artemcz. (op. cit. 38) is recognized; entire plant lanate-arachnoid, with basal leaves up to 3 mm wide, expanded at the base; cauline leaves amplexicaul, expanded at the base, undulate along margin, annulately or spirally twisted upward; peduncles glabrous; achenes with a short beak. On steppe slopes and meadows of Dnieper.

46. **T. elatior** Stev. in Bull. Soc. Nat. Mosc. XXIX (1956) 407; Boiss. Fl. or. III, 749; Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 41; C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V, 44; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65, Karte 3.—*T. brevirostre* auct. non DC.: Velen. Fl. Bulg. (1891) 367; Schmalh. Fl. II, 146.

Biennial. Root relatively slender, easily pulled out. Plants 90–125 cm high, glabrous; stem erect, solitary, branched. Basal leaves 5–7 cm wide, oblong-lanceolate, more or less long-petiolate, acuminate, undulate-involute along margin; cauline leaves expanded at base, reduced, narrowed into lanceolate lamina, acuminate; upper leaves also expanded at base, up to 5 mm wide, subulately pointed gradually, about 10 mm long. Peduncles not thickened below capitula. Capitula at fruiting up to 6 mm wide near base, at flowering 2–2.5 cm long; involucre bracts eight, up to 21 mm long, acute, lanceolate; florets yellow; peripheral florets usually longer than involucre bracts or as long. Peripheral achenes with pappus about 3 cm long, without pappus about 1.4 cm long, 10-angled, curved, sulcate-scabrous, gradually narrowed into thick, short, 3–4 mm-long, sulcate beak; pappus grayish, 11–15 mm long, with scarcely hairy annulus at base. Flowering May to June (September).

Grassy areas of lower mountain zone.—*European Part*: Crimea. *General distribution*: Balkans-Asia Minor (Bulgaria), Iran. Described from Laspi. Type in Helsinki.

Note. The report of Grossheim (*Opred. Rast. Kavk.* 506) about the occurrence of this species along the Black Sea Coast (from Anapa to

Tuapse) should be attributed to *T. dasyrhynchus* Artemcz.; *T. elatior* Stev. differs from this latter species by larger size, thicker achenes with a short, thick beak, and wide basal leaves.

Series 2. Graminifolii Kuthath. Kavk. Predst. Tragop. (1957) 12.—*Series Filifolii* Kuthath. Ibid. 19, p. p.—Florets yellow or orange-yellow, sometimes with violet veins on drying; involucre bracts shorter than florets, 6–10; achene with beak much shorter than its body, or almost beakless; capitula small, less often medium, up to 3 cm long; plants perennial.

- 169 47. ***T. graminifolius*** DC. Prodr. VII (1838) 114; Ldb. Fl. Ross. II, 2, 788; Boiss. Fl. or. III, 752; Schmalh. Fl. II, 146; Grossh. Fl. Kavk. IV, 233; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65, Karte 1; Kitam. Fl. Afgh. 452; Kuthath. in Fl. Azerb. VIII, 501.—*T. caucasicum* auct. non Bess.: Fisch. and Mey. ex DC. Prodr. VII (1838) 114 pro syn.—*T. talyshense* Boiss. and Buhse in Nouv. Mém. Soc. Nat. Mosc. XII (1860) 137.—*T. orientalis* auct. fl. Cauc., non L.—**lc.**: Boiss. and Buhse op. cit. t. 9; Borissova in Fl. Turkm. VII, Plate XLIV, Fig. 2; Kuthath. in Fl. Azerb. VIII, Plate VII.

Perennial. Root vertical, fusiform. Plants almost glabrous or, less often flocculose-lanate, 20–90 cm high, with numerous stems originating from base; root collar covered with fibers of old leaves. Stems simple or branched, with ascending or erect branches. Leaves graminaceous, green, flat, with five veins, linear or linear-lanceolate to lanceolate, 4–8 mm wide, weakly recurved and acuminate; upper leaves reduced, often expanded at base. Peduncles exceeding leaves, not thickened below capitula and slightly hairy. Capitula small or medium, few-flowered; involucre bracts eight, at fruiting 4–8 mm wide, shorter than achenes and slightly shorter than florets; florets pale yellow, whitish on drying, exceeding involucre by one-third. Peripheral achenes terete, shallow-sulcate, 10-ribbed, white-tuberculate-squamose or sharply acicular-tuberculate, 2.5–3 cm long with pappus, about 1.1 cm long without pappus, 1.5 mm wide, almost smooth near base; body of achene about 0.8 cm long, gradually narrowed into finely sulcate, 3–8 mm-long beak slightly shorter or almost as long as achene, with hairy annulus and swollen at apex; pappus about 1.1 cm long, almost as long as achene with beak. Flowering April to June; fruiting June to September.

Meadows, scrubs, up to middle mountain zone.—*Caucasus*: Ciscaucasia, Dagestan, Eastern, Western, and Southern Transcaucasia, Talysh; *Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Asia Minor (former Kars Region), Iran. Described from Imeretia. Type in Paris.

48. **T. brevirostris** DC. Prodr. VII (1838) 114 excl. var.; Ldb. Fl. Ross. II, 2, 788, p. p.; Boiss. Fl. or. III, 799, p. p.; Schmalh. Fl. II, 146, p. p.; Grossh. Fl. Kavk. IV, 231; Fedtsch. and Fl. Fl. Evrop. Ross. 1043, p. p.; Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II, 27, p. p.; Kuthath. Kavk. Predst. Tragop. (1957) 15; Kuthath. in Fl. Azerb. VIII, 502.—*T. brevirostris* var. *genuinus* Schmalh. op. cit. p. p.—*T. brevirostris* subsp. *genuinus* C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 39, p. p.; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65, Karte 1, p. p.—*T. caucasicus* Bess. ex DC. l. c. pro syn., non Fisch. and Mey. nec. Szov.—**lc.**: Kuthath. op. cit. Plate 1, Fig. 2, Map 3.

Perennial. Plants glabrous, grayish-green, sometimes arachnoid or flocculose until flowering at stem base and below capitula; root collar 170 sparsely covered with fibers or not. Stems often numerous, less often solitary, 30–60(90) cm high, 1.5–3 mm thick, usually branched above base, with erect virgate branches bearing solitary capitula. Basal leaves long, slightly expanded at base, linear or linear-lanceolate, 2–4 mm wide; cauline leaves linear or linear-lanceolate, 1.5–4 mm wide at base, subulately acuminate; upper leaves reduced, 1–1.5 mm wide at base, folded into subulately narrowed lamina, strongly recurved at apex, up to 21 cm long. Peduncles oblong, glabrous, not thickened below capitula, sparsely leafy. Capitula small, 5–7 mm wide at base; involucre bracts eight, almost as long as florets or shorter, bracts lanceolate-linear, 20–25 mm long, 3–4 mm wide at base, sometimes 5–7 mm wide at fruiting, acuminate; florets yellow, slightly exceeding involucre, violet on drying. Peripheral achenes 2.5–2.8 cm long, about 1 mm wide, acutely dentate-tuberculate-squamose at base, with 12 ribs covered by whitish scales, shallow-sulcate, gradually narrowed into glabrous, smooth, white beak clavately thickened below pappus; beak 3–6 mm long, achenes without beak about 1.3 cm long; pappus longer than achene with beak, white, 10–15 mm long, with hairy annulus at base. Flowering April to May; fruiting June to August.

Grows in upland steppes, sometimes on sands and limestones, on coastal sands and rocks.—*Caucasus*: Ciscaucasia, Eastern and Western Transcaucasia, Dagestan. Endemic. Described from the Caucasus on the basis of plants raised by Besser from seeds supplied by Steven. Isotype in Leningrad; type in Paris.

Note. The beak of the achene is almost absent in the plants collected in Dagestan.

49. **T. serotinus** Sosn. in Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 16 (1951) 98; Kuthath. in Fl. Gruzii VIII, 635; Kavk. Predst. Tragop. (1957) 18; in Fl. Azerb. VIII, 502.—**lc.**: Kuthath., op cit. (1951) Fig. 2; op cit. (1957) Plate 1, Fig. 3, Map 2; Makashvili, Fl. Okr. Tbil. II, 223.

Perennial. Plants 35–50 cm high, sparsely flocculose; root collar covered with fibers and previous year's dry leaves; stems numerous, branched, densely leafy, ascending. Leaves narrowly linear; basal leaves longer, cauline leaves reduced, gradually acuminate, usually slightly falcate, folded. Peduncles exceeding leaves, slender, not thickened below capitula, densely pubescent. Capitula numerous, small; florets pale yellow, as long as or slightly longer than involucre; involucre bracts six to eight, lanceolate. Peripheral achenes about 2.5 cm long, excluding pappus about 1.4 cm long, shallow-sulcate, squamose-tuberculate, 10-ribbed, obtusely angular, with two rows of solitary indistinct scales, almost smooth at base, narrowed at apex into about 0.5 cm-long beak, almost half as long as body of achene (about 0.9 cm long), glabrous or slightly hairy below pappus; pappus about 1.2 cm long, shorter than achene with beak. Flowering April to September; fruiting August to November (up to late autumn).

Stony dry slopes and hills, coastal sands, in lower and middle mountain zones, at 900–1,000 m.—*Caucasus*: Eastern Transcaucasia (vicinity of Tbilisi, Kartlia, Meskheta). Endemic. Described from the vicinity of Tbilisi. Type in Tbilisi.

Note. It differs from *T. graminifolius* DC. by its very slender and strongly branched stems, narrower leaves, densely pubescent peduncles, small capitula, paler yellow florets, general appearance, and time of flowering.

50. ***T. filifolius*** Rehm. ex Boiss. Fl. or. III (1875) 754; Grossh. Fl. Kavk. IV, 232; Kuthath. in Fl. Azerb. VIII, 504.—*T. filifolium* var. *macrorrhizum* Somm. and Lev. in Tr. Peterb. Bot. Sada XVI (1901) 291.—**lc.**: Kuthath. in Fl. Gruzii VIII, Fig. 432; Kavk. Predst. Tragop. (1957) 19, Plate 1, Fig. 4 (incorrect).

Perennial. Root vertical, slender or thick, but not tuberous; root collar densely covered with fibers. Stems less numerous, usually two or three, ascending, not branched at base, 10–30 cm high. Basal and lower cauline leaves narrow, filiform, about 2.5 mm wide, sometimes to fibriform, 5–7 cm long, recurved, lanate-flocculose near sheaths, numerous, other leaves glabrous; cauline leaves expanded at base up to 4 mm. Peduncles much exceeding basal leaves, tomentose below capitula. Capitula about 2.5 cm long; involucre bracts 8–10, erect, about 10 mm long, narrow, acuminate, tomentose at base, shorter than florets; ligulate florets orange-yellow with purple stripes, exceeding involucre by one-fourth. Outer achenes about 2.4 cm long with pappus, without pappus about 1 cm long; body of achene weakly ribbed and scabrous along ribs, mainly in upper part, about 7 mm long, gradually narrowed into sulcate, short, 0.3–0.4 cm-long beak slightly swollen at apex and with

hairy annulus; pappus about 1 cm long, some pappus bristles longer and scabrous (at apex); inner achenes almost smooth. Flowering May to July; fruiting June to August.

In rock crevices and meadows of alpine and subalpine zones.—*Caucasus*: Ciscaucasia, Eastern and Southern Transcaucasia, Dagestan. Endemic. Described from Daryal ravine. Type in Krakow, holotype in Tbilisi.

51. *T. colchicus* Alb. Probr. fl. Colch. (1895) 151; Grossh. Fl. Kavk. IV, 232; Kuthath. in Fl. Gruzii VIII, 631; Kavk. Predst. Tragop. (1957) 20.—*lc.*: Kuthath. op. cit. (1957) Plate II, Fig. 6 (incorrect), Map 2.

Perennial. Root thick, cylindrical, but not tuberous; root collar densely covered with fibers. Stems 20–30 cm high, numerous, erect.
172 Basal leaves numerous, narrowly linear, slightly narrowed toward base, much shorter than peduncles, up to 20 cm long, 1–1.5 mm wide; upper cauline leaves semiamplexicaul, filiform-acuminate; upper leaves 4–5 cm long. Peduncles exceeding leaves, erect, not thickened below capitula. Capitula medium, 2–3 cm long, tomentose at base; involucre bracts seven or eight, lanceolate, finely acuminate, expanded at base to 0.5 cm, 2–2.5 cm long; florets yellow or orange-yellow, two times as long as involucre. Achenes with pappus about 2 cm long, without pappus about 1 cm long, 1 mm wide, smooth, obtusely sulcate, not scabrous, almost without beak; pappus about 0.9 cm long, white or gayish white. Flowering May to July.

Meadows in alpine and subalpine zones, on limestones and rocks, at 2,000–2,350 m.—*Caucasus*: Western Transcaucasia. Endemic. Described from Mingrelia. Type in Tbilisi.

Series 3. Stepposi Boriss. Involucre bracts seven or eight, as long as florets or shorter; capitula small, florets yellow; achenes small, beak of achene not developed or indistinct; pappus almost as long as achene; biennial meadow-steppe plants, also growing on sands.

52. *T. stepposus* (S. Nikit.) Stank. in Stank and Tal. Opred. Vyssh. Rast. (1949) 691.—*T. podolicum* subsp. *stepposum* S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII 12 (1937) 261; in Fl. Yugo-Vost. VI, 444.—*T. podolicum* auct. fl. ross. et fl. turk. p. p. non DC., nec Artemcz.: Kryl. Fl. Zap. Sib. XI, 2975.—*T. brevirostris* subsp. *podolicus* var. *stepposus* C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 40.—*T. brevirostre* auct. fl. ross.: Kryl. Fl. Alt. III (1904) 730, non DC.—*T. brevirostre* var. *angustifolium* S. Nikit. in Majevski, Fl. 6th ed. (1933) 706.—*lc.*: C. Rgl. op. cit. Abb. 2.

Biennial. Root vertical, cylindrical; root collar covered with remnants of old dry leaves. Plants grayish-green, 30–90 cm high. Stems slender, numerous, branched from middle, initially more or less arachnoid, flocculose, glabrescent. Lower leaves narrowly linear, 1–3(6) mm wide,

usually folded; middle cauline leaves flat, slightly expanded at base, narrow to filiform upward; upper leaves lanceolate to oblong-lanceolate, 4–14 mm wide. Peduncles not thickened below capitula. Capitula relatively small, at fruiting 17–25(30) mm long; involucre bracts seven or eight, 15–22 mm long, shorter than florets and achenes or almost as long as latter; florets light yellow. Peripheral achenes about 2.3 cm long including pappus, excluding pappus 1 cm long, 1.5 mm wide, slightly curved, sulcate, with distinct sculpture, usually with undeveloped scales, gradually narrowed toward apex, almost without beak, without swelling (nob); pappus slightly longer than achene, about 1.3 cm long; inner achenes about 2.6 cm long with pappus, 1.3 cm long without pappus, straight, about 1 mm wide, weakly scabrous, without beak, pappus about 1.5 cm long. Flowering June to July.

- 173 Steppe and forest-steppe zones, on steppe slopes, alkaline steppes; desert-steppe zone.—*European Part*: Volga-Don, Lower Volga, Trans-Volga Region; *Western Siberia*: Upper Tobol, Irtysh, Altai; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region. Endemic. Described from vicinity of Lake Zaisan. Type in Leningrad.

Note. It differs from *T. podolicus* Bess. by the narrowly linear leaves, often folded and straight (and not involute), small capitula, beakless achenes without thickening at the tip, sculpture and size of the achene and pappus, as well as the range. It differs from *T. scoparius* S. Nikit. by the narrowly linear, straight leaves, slender stems, small heads, less deeply sulcate achenes, and range.

53. ***T. ucrainicus*** Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 38; Klok. in Vizn. Rosl. URSR, 590; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 2.—*T. canus* auct. non Willd.: Bess. Enum. pl. Volh. (1822) 30.—(?) *T. villosum* auct. non L.: Pall. Reise II (1778) 332, 464, p. p.; III, 537, 654, 682; DC. Prodr. VII, 115.—*T. floccosus* auct. fl. ucr. non Waldst. and Kit.—**Ic.**: Artemcz. op. cit. Fig. 3; C. Rgl. op. cit. Abb. 6, 17.

Biennial. Root long, vertical; root collar covered with dry old leaves or fibers. Plants 30–80 cm high, more or less densely pubescent, canescent mainly on young branches and below capitula, arachnoid-tomentose. Stems solitary, often pyramidally branched from base. Basal leaves narrower than cauline, linear, 2–3 mm wide, flat or folded, expanded at base, pale violet, with long lamina; cauline leaves reduced, expanded at base to 6–7 mm, with somewhat long lamina, undulate, acuminate, contorted or spirally twisted; upper cauline leaves as also middle, spirally twisted or annular, reduced, 10–50 mm long, 4–8 mm wide at base. Peduncles not thickened below capitula; involucre bracts (seven) eight, 15–23 mm long at fruiting, 5–10 mm wide, basally tomentose; florets yellow, exceeding involucre bracts, less often as long.

Achenes with pappus about 2.3 cm long, without pappus 1.3 cm long, smooth or weakly scabrous above or throughout, gradually narrowed into short glabrous, somewhat thick, about 3–4 mm-long beak less often half as long as achene; pappus short, shorter than achene, about 1 cm long, with erect hairs and short hairy annulus at base. Flowering May to September.

Sands in forest-steppe and steppe zone, pine forest sands, wastelands, and old sandy fields.—*European Part*: Upper Dnieper, Middle Dnieper, Volga-Don (along Donets), Lower Don. Endemic. Described from Kharkov Region. Type in Kiev.

Note. Artemczuk recognizes var. *lasiocarpus* Artemcz. (op. cit.) with a scabrous achene and smooth beak, one-fourth as long as the achene; f. *striioantherus* Artemcz.—with an anther tube having five black stripes at the tip; and f. *flaviantherus* Artemcz.—with a pale yellow anther tube.

- 174 54. **T. daghestanicus** (Artemcz.) Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 17 (1953) 42; C. Rgl. in Berichte Schweiz. Bot. Gesellschaft. 65 (1955) Karte 2; Kuthath. Kavk. Predst. Tragop. (1957) 24.—*T. dasyrhynchus* subsp. *daghestanicus* Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 44; C. Rgl. op. cit. 257.—*T. floccosus* auct. fl. cauc. non Waldst. and Kit.—*T. ruthenicus* auct. fl. cauc. non Bess.—**!c.**: Kuthath. op. cit. (1953) Fig. 8; op. cit. (1957) Fig. 9, Map 2.

Biennial. Root robust, hard, cylindrical; root collar usually covered with fibers. Plants up to 60 cm high, entirely densely grayish-flocculose-arachnoid, especially in upper part. Stems solitary, branched in upper part, less often from base. Basal leaves linear, long, sometimes folded; lower cauline leaves linear but expanded at base; upper leaves reduced, gradually narrowed from broad base into rather long, thin acuminate apex. Peduncles not thickened below capitula. Florets yellow; involucre bracts eight, lanceolate, about 25 mm long, shorter than achene with pappus; achenes including pappus about 3.2 cm long, excluding pappus about 1.4 cm long, without beak, shallow-sulcate above, with two rows of scales, rest smooth; pappus about 1.8 cm long, longer than achene, with annulus of short hairs at base. Flowering May to June.

Semidesert steppes among hummocky sand dunes, along the coast of the Caspian Sea and in foothill steppes.—*European Part*: (?) Trans-Volga Region, Lower Don, Lower Volga (Ergeni); *Caucasus*: Ciscaucasia (eastern), Dagestan. Endemic. Described from Dagestan. Type in Leningrad.

Note. *T. floccosus* Waldst. and Kit. was mistakenly reported for the flora of the USSR. It is an endemic of sands along the Danube; it differs from *T. daghestanicus* by the narrowly linear, grooved basal leaves, smaller, numerous capitula, and chiefly marginal achenes, which are usually smooth in the lower part and tuberculate above, and by the

presence of a short beak. *T. floccosus* Waldst. and Kit. belongs to the series *Dasyrhynchiformes* Artemcz. of psammophilous species.

55. *T. borystenicus* Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 47; Klok. in Vizn. Rosl. URSS 590.—*T. brevirostris* subsp. *borystenicus* (Artemcz.) C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V (1937) 41.—**lc.**: Artemch. op. cit. Fig. 5; C. Rgl. op. cit. Abb. 5, 15.

Biennial. Root robust, cylindrical, hard; root collar densely covered with fibers. Plants 30–110 cm high, more or less pubescent; bases, mainly of basal leaves and stems below capitula more or less flocculose-tomentose, less often almost glabrous. Stems branched, with virgate divergent branches. Basal leaves narrower than cauline ones, 2–6 mm wide, narrowly linear; upper cauline leaves very short, 3–10 mm wide at base, ovate-cordate, abruptly acuminate, with short recurved cusp; cauline leaves pale lilac below, not involute, expanded at base, lamina folded or flat, gradually narrowed. Peduncles not thickened below
175 capitula. Involucral bracts (seven) eight, at fruiting 15–28 mm long, 5–7 mm wide, shorter than florets, sometimes violet, as also branches. Florets yellow; achenes with pappus 16–19 mm long, about 1 cm long without pappus, sulcate along ribs, weakly squamose, sharply scabrous, less often almost smooth, gradually narrowed toward both ends, without beak; pappus 7–10 mm long, white or greenish-white, as long as achene, less often shorter, with annulus of soft hairs at base. Flowering May to September.

Sands of river valleys, steppe regions, and pine forests.—*European Part*: Black Sea Region (lower reaches of the Dnieper and Southern Bug, Dzharlagach Island). Endemic. Described from former Kherson District. Type in Kiev.

Note. Plants with weakly scabrous achenes have been found on the Aleshki sands; plants up to 110 cm high have been reported from the vicinity of Nikolaev and on Dzharlagach Island. C. Regel considers it a species of hybrid origin.

It is possible that after further study *T. borystenicus* may be transferred to another series and, maybe, even to another section (*Bessera* Boriss. or *Nikitinia* Boriss.).

Section 11. Sosnovskya Boriss. sect. nov. in Addenda XXVIII, 724.—Peduncles not thickened below capitula; medium to rather large, 3.5–5 cm long, on straight peduncles; involucral bracts eight, much shorter than florets and as long as outer achenes; florets large, yellow, orange-yellow, or pale yellow; achenes large, straight, whitish, gradually narrowed into somewhat thick, sometimes indistinct beak shorter than body of achene; pappus almost as long as achene with beak. Perennial, less often biennial plants, with thick cylindrical roots.

Type of section: *T. reticulatus* Boiss. and Huet.

Series 1. Marginati Kuthath. Kavk. Predst. Tragop. (1957) 26, p. p.—Florets yellow; achenes gradually narrowed into somewhat thick, indistinct beak shorter than body of achene; pappus dirty-golden, longer than achene with beak; root cylindrical, thick; perennial.

56. ***T. marginatus*** Boiss. and Buhse in Nouv. Mém. Soc. Nat. Mosc. XII (1860) 136; Kuthath. Kavk. Predst. Tragop. (1957) 26; id. in Fl. Azerb. VIII, 505.—*T. collinum* auct. non DC.: Boiss. Fl. or. III (1875) 746, p. p.—*T. acanthocarpum* Boiss. op. cit. 751 p. p.—*A. flexuosus* Sosn. ex Grossh. Fl. Kavk. IV (1934) 232; Kuthath. in Fl. Gruzii VIII, 627.—**Ис.:** Kuthath. op. cit. (1957) Plate III, Fig. 10, Map 4.

Perennial. Root cylindrical, thick; root collar covered with sheaths of previous year's leaves. Plants glabrous or glaucous, weakly flocculose, 10–20(25) cm high. Stems whitish, branched from base or simple. Basal 176 leaves lanceolate or linear, acuminate, expanded at base; cauline leaves much shorter than basal, semiamplexicaul, apiculate, with white border, glaucous, often undulate. Peduncles not thickened below capitula. Involucral bracts eight, lanceolate, acuminate, flocculose at base, shorter than ligulate florets and slightly shorter than achenes with pappus, or as long. Capitula 3–4 cm long at fruiting, 2–2.5 cm long at flowering; florets yellow. Achenes with pappus about (3)3.7–4 cm long, without pappus about 1.5–1.9 cm long, about 2 mm wide, sulcate, whitish, 10-ribbed, scabrous, covered with fine subobtuse scales, gradually narrowed into thick, sulcate, indistinct beak, half as long as scabrous body of achene; pappus about 2.5 cm long, dirty golden, whitish-grayish, slightly shorter than achenes with beak. Flowering April to June; fruiting June to August.

Dry slopes, on stony, rubbly, sandy-clayey, clayey and gypsic habitats, in the lower and middle mountain zones.—**Caucasus:** Eastern and Southern Transcaucasia, Talysh. Endemic(?). Distribution in Iran possible. Described from vicinity of Nakhichevan. Type in Leningrad.

Series 2. Reticulati Boriss.—Flowers yellow, orange-yellow, or pale yellow; achenes gradually narrowed into beak, 5–8(10) mm long; perennial, rarely biennial plants; capitula medium.

57. ***T. reticulatus*** Boiss. and Huet in Boiss. Diagn. pl. or. ser. II, 3 (1856) 90; Boiss. Fl. or. III, 752; Grossh. Fl. Kavk. IV, 233; Kuthath. in Fl. Gruzii VIII, 632; Kavk. Predst. Tragop. (1957) 21; in Fl. Azerb. VIII, 504.—*T. reticulatus* var. *stenophyllus* Boiss. Fl. or. III (1875) 752.—*T. stenophyllus* Boiss. and Huet, op. cit. 89.—**Ис.:** Kuthath. op. cit. (1957) Fig. 7.

Perennial. Root cylindrical, vertical; root collar densely covered with reticulate fibers. Stems several, 20–65 cm high, erect, initially tomentose, glabrescent, simple, densely leafy. Leaves numerous; basal leaves linear, acuminate, many-veined, slightly shorter than stem; cauline leaves 5–12 mm long at base, amplexicaul, oblong, acuminate, often undulate-crisped, not exceeding peduncles, often flocculose along margin. Peduncles not thickened below capitula; involucre of eight lanceolate bracts, weakly flocculose at base. Capitula 3–4 cm long at flowering; florets bright yellow, usually pale lilac on drying, much longer than involucre. Achenes with pappus about 3.6 cm long, without pappus about 1.5–1.9 cm long, slightly curved, sulcate, finely tuberculate-squamose, scabrous, beak flat, 0.25–0.5 cm long, somewhat thick, sulcate; weakly swollen at apex and with undulate annulus; pappus 1.7–2 cm long, white or grayish. Flowering May to June; fruiting June to July.

Alpine and subalpine meadows, at 1,900–3,000 m.—*Caucasus*: Dagestan, Eastern Western Transcaucasia (rarely), and Southern 177 Transcaucasia, Talysh. *General distribution*: Armenia and Kurdistan, Asia Minor. Described from vicinity of Erzurum. Type in Geneva.

Note. Sommier and Levier (1900) reported var. *macroglossus* Somm. and Lev., from Svanetia, which differs from the typical form by the larger capitula, florets, and leaves.

58. **T. charadzeae** Kuthath. in Zam. po Sist. i Geogr. Rast. Tbil. 17 (1953) 30; in Fl. Gruzii VIII, 632; Kavk. Predst. Tragop. (1957) 20.—**lc.**: Kuthath. op. cit. (1953) Fig. 2; op. cit. (1957), Plate II, Fig. 5. Map 1.

Perennial. Root vertical, cylindrical; root collar densely covered with fibers and remnants of old leaves. Plants light green, glabrous or weakly flocculose at stem base. Stems 40–60 cm high, solitary or two, erect, simple, cylindrical, bearing single capitulum at apices of stems. Basal leaves numerous, narrowly linear, long, not exceeding peduncles; cauline leaves lanceolate, expanded at base, amplexicaul, long-acuminate. Peduncles not thickened below capitula, covered with yellowish flocculose pubescence; florets pale yellow. Involucral bracts eight, lanceolate, 2.5–2.7 cm long, at fruiting deflexed, often involute, shorter than achenes with pappus. Peripheral achenes about 4.2 cm long with pappus, straight, without pappus 2.3 cm long, body of achene about 1.8 cm long, indistinctly ribbed above, indistinctly squamose along ribs, gradually narrowed into straight, about 0.5 cm-long beak; pappus about 1.8 cm long, shorter than achene, yellowish-golden, with undulate annulus at base; inner achenes about 3.8 cm long with smooth body, weakly sulcate above, but without scales, gradually narrowed into about 0.5 cm-long beak. Flowering June to July; fruiting July.

Subalpine meadows.—*Caucasus*: Eastern Transcaucasia (Georgia, Akhalkhevi District). Endemic. Described from Georgia. Type in Tbilisi; isotype in Leningrad.

Note. From *T. filifolius* Rehm., with which it is united by Kuthatheladze (op. cit.) into one series, it is distinguished by wide basal leaves and broadly lanceolate cauline leaves (and not filiform basal leaves), deflexed, and not erect, involucre bracts, longer pale yellow (and not orange-yellow) florets, longer and entirely smooth inner achenes with a short beak, and a 14–18 mm-long (not about 1 cm-long) pappus.

59. *T. maturatus* Boriss. in Fl. Turkm. VII (1960) 297.—*T. praecox* S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12 (1937) 273, non Focke (1906).

Biennial. Root cylindrical, vertical. Plants glabrous, branched below, 178 leafless above. Stems 50–80 cm high, more or less 3 mm thick. Leaves remote, more or less undulate, expanded and amplexicaul at base; lower leaves linear, 7–12(14) mm wide at base, 18–25 cm long, 5–8(10) mm wide in middle; middle leaves 10–12 cm long, about 10 mm wide. Peduncles 8–30 cm long, much longer than leaves, 2.5–4(6) mm thick below capitula. Capitula about 3 cm long at flowering, 3–3.5(5) cm long at fruiting; involucre bracts 8–10, lanceolate-linear, thin-acuminate, much shorter than florets and slightly shorter than achenes; florets exceeding involucre, about 2.5 cm long, pale lilac on drying, thin. Peripheral achenes with pappus 3–4.3 cm long, without pappus 1.7–2.5 cm; body of achene 0.8–1.5 cm long, sulcate, sharply squamose, mainly above with remote erect scales; weakly scabrous below, basally drawn out and smooth, gradually narrowed toward apex into 0.8–1 cm-long, sulcate beak, almost without scales, not swollen at apex and with hairy annulus; pappus dirty white, with unequal hairs shorter than achene with beak, 1.3–1.8 cm long. Flowering May to June; fruiting May to July.

Mountains, on slopes, at 1,550–1,650 m.—*Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Iran. Described from Iran. Type in Leningrad.

Section 12. Dubjanskya Boriss. sect. nov. in Addenda XXVIII, 724.—Peduncles strongly thickened below capitula; capitula large, 5–6 cm long, solitary, on long peduncles; involucre bracts 8–12; florets yellow; achenes with short, about 3 mm long, thick beak; pappus as long as achene or slightly longer; biennial, robust, psammophilous plants.

Type of section: *T. sabulosus* Krasch. and S. Nikit.

60. *T. sabulosus* Krasch. and S. Nikit. in Otch. Pochv.-Bot. Otr. Kazakhst. E'ksp. Akad. Nauk SSSR, IV, 2 (1930) 294; Nikit. in Izv. Glavn. Bot. Sada XXIX, 5–6, 489; Pavlov. Fl. Tsent. Kazakhst. III, 338;

Kryl. Fl. Zap. Sib. XI, 2976; C. Rgl. in Berichte Schweiz. Bot. Gesellschaft. 65 (1955) Karte 3; Kovalevskaja in Fl. Uzb. VI, 433.—**lc.**: Krasch. and S. Nikit. op. cit. Fig. 2.

Biennial. Root long, robust, straight, fusiform, unbranched; root collar sometimes covered with fibrous remnants of previous year's leaves. Plants 40–150 cm high, entirely glabrous. Stems up to 1.5 cm thick, erect, weakly sulcate, branched above, densely leafy from base. Lower leaves green, linear, almost not expanded at base, 18–40 cm long, 5–10 mm wide, often folded, withering at fruiting; middle leaves linear, glaucous, semiamplexicaul, up to 10–12(25) mm wide at base, narrowed upward, acuminate, 10–25 cm long, sometimes folded; upper leaves few, (3)4–10 cm long, 5–15 mm wide, ovate at base, abruptly narrowed, thin-acuminate, sometimes upper leaves absent or persisting up to inflorescence. Peduncles clavate below capitula. Capitula 2–10, (3.5)4.5–5.5(6.5) cm long and 1.5–3 cm, wide at fruiting; involucre bracts 8–12, 3.5–5 cm long, 5–9 mm wide, broadly linear, gradually narrowed, long-acuminate, shorter than florets and achenes, deflexed after fruiting; florets yellow, large. Achenes with pappus 3.5–5 cm long, without pappus 1.6–2.5 cm; body of achene five-angled, 1.2–1.6 cm long, 1–2.5 mm wide, finely sulcate, finely scabrous-tuberculate, with short and about 3 mm long, thick, sulcate beak, with hairy annulus at apex; pappus 2.3–2.6 cm long, slightly longer than achene with beak, whitish or yellowish, with unequal longer hairs smooth at apex. Flowering May; fruiting June. (Plate IX, Fig. 2.)

Hummocky sands with sparse thickets.—*Western Siberia*: Upper Tobol, Irtysh, Altai; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region, Kyzyl-Kum. *General distribution*: Dzhungaria-Kashgaria, Mongolia (western Mongolia). Described from sands in lower reaches of Sary River. Type in Leningrad.

Economic importance. A fodder plant.

Section 13. *Dasypogon* Boriss sect. nov. in Addenda XXVIII, 724.—Peduncles not thickened; capitula 3–3.5(4) cm long, numerous; involucre bracts five, less often six, slightly shorter than florets and achenes, pubescent; florets pale yellow, pale violet on drying; achenes less numerous, about five, without beak, somewhat thick, sulcate and tuberculate; pappus slightly exceeding achene; perennial or biennial plants, spreading and branched from base.

Type of section: *T. kopetdaghensis* Boriss.

61. *T. kopetdaghensis* Boriss. in Fl. Turkm. VII (1960) 296, 380.

Perennial or biennial. Root virgate, thickened; root collar sometimes branched, covered with brownish remnants of old dead leaves. Plants 20–25 cm high, spreading, branched from very base. Stems few, erect or

arcuate, pubescent mainly near peduncles, almost glabrous at flowering, finely sulcate; all stems terminating into fertile capitula. Cauline leaves narrow, linear, acuminate with filiform apex, semiamplexicaul, expanded at base up to 6–8 mm, flocculose-lanate, tomentose mainly near leaf base; upper leaves up to 4 cm long, lower up to 20 cm, sometimes folded, longer than peduncles. Peduncles not thickened, tomentose near base of capitulum. Capitula medium, at fruiting 3–3.5(4) cm long, about 1–1.5 cm wide in middle; involucre bracts five, less often six, 2.5–3.5 cm long (with pappus), lanceolate, broader, at base up to 4–5 mm, narrowed toward apex, tomentose at flowering, with sparse pubescence or almost
 180 glabrous at fruiting; florets pale yellow, pale lilac on drying, with five violet teeth and dark veins, slightly longer than involucre, about 1 cm long, about 1.5 mm wide; with white intertwined hairs at corolla base; stamens about 5 mm long, dark violet. Achenes few, about five, somewhat thick, without beak; outer achenes with pappus about 3.5 cm long, slightly curved, four- or five-ribbed, finely sulcate and sharply tuberculate throughout, more sharply sulcate and weakly tuberculate at base, about 1.5 cm long, narrowed at apex and with hairy annulus; pappus slightly longer than achene, about 2 cm long, with plumose, almost equal hairs, with few prominent filiform brownish hairs. Flowering May. (Plate X, Fig. 2.)

Gravelly slopes in wormwood semidesert zone.—*Soviet Central Asia*: mountainous Turkmenia (central Kopetdag, southeastern spurs of Kelyat Range). Possibly occurring in Iran. Described from Kopetdag. Type in Leningrad.

Note. The only species of goat's-beard in Turkmenia with a beakless achene. From all other species having achenes with or without a short beak, it is distinguished by a pappus larger than the achene, involucre bracts five, less often six (but not eight), shorter ligulate florets, a small number of achenes in the capitulum, and by the sculpture of the achenes.

Section 14. Nikitinia Boriss. sect. nov. in Addenda XXVIII, 725.—Ser. *Dasyrhynchiformes* Artemcz. in Uch. Zap. Chernov. Univ. I (1948) 89, p. p.—Peduncles not thickened; capitula medium, 20–45 mm long, numerous, on short peduncles, in compound panicles; involucre bracts (7)8–12; florets yellow; achenes somewhat thick with or without short thick beak; pappus slightly shorter, slightly longer or as long as achene; biennial plants with sulcate branched stems, confined to sands and sandy soils.

Type of section: *T. dubjanskyi* Krasch. and S. Nikit.

62. **T. dubjanskyi** Krasch. and S. Nikit. in Otch. Pochv.-Bot. Otr. Kazakhst. E'ksp. Akad. Nauk SSSR IV, 2 (1930) 289; S. Nikit. in Izv.

Glavn. Bot. Sada XXIX, 5-6, 489; Pavlov, Fl Tsentr. Kazakhst. III, 338; Kryl. Fl. Zap. Sib. XI, 2978; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 2.—**Ис.**: Krasch. and S. Nikit. op. cit. Fig. 1.

182 Biennial. Root fusiform, straight, robust, long, unbranched; root collar not covered with fibers. Plants 40-150 cm high, wholly glabrous. Stem robust, up to 1.5 cm thick at base, straight, smooth or weakly sulcate, strongly branched from middle, densely leafy from base. Lower leaves green, glabrous, linear, slightly expanded at base, 15-40(50) cm long, 5-15 mm wide, folded, later completely drying out; middle leaves glabrous, 182 glaucous, semiamplexicaul, 8-10-veined, 10-30 cm long, 12-30 mm wide at base, gradually narrowed upward to 3-8 mm, often folded, undulate; upper leaves much shorter, 4-10 cm long, 5-30 mm wide at base, ovately expanded up to 25-30 mm and obtuse, amplexicaul, abruptly narrowed at apex, or not narrowed at all. Peduncles not thickened below capitula; capitula less numerous (10-70), in compound panicles, 20-45 mm long at fruiting. Involucral bracts (7)8-12, broadly lanceolate, 20-30 mm long, 3-6 wide, narrowed toward apex, glabrous, glaucous, deflexed after fruiting and seed shedding; florets light yellow. Peripheral achenes large, oblong, with pappus 2.5-3.5 cm long, without pappus 1.4-2 cm, 1.5-2 mm wide; indistinctly five-angled, almost globose, spinulose-tuberculate, ribbed and sulcate, less often smooth, weakly curved, without beak; pappus whitish or dirty yellowish, about 1.5 cm long, slightly shorter than achene, without hairy annulus at base, one-rowed plumose, with unequal hairs; longer hairs not plumose at apex; inner achenes more or less glabrous or weakly sulcate. Flowering May to June; fruiting May to August.

Hummocky, sparsely vegetated sands of western Kazakhstan, less often in sandy steppes.—*Soviet Central Asia*: Aralo-Caspian Region. Endemic. Described from sands of Kok-Dzhid on Emba River. Type in Leningrad.

Economic Importance. A food and fodder plant.

63. **T. scoparius** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII, 12 (1937) 262; Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II, 43, in obs.

Biennial: Root robust, vertical, straight; root collar covered with remnants of old leaves. Plants large, up to 1.5 m high. Stems thick, sulcate, strongly branched above, flocculose-tomentose above and at leaf bases. Lower leaves linear, weakly expanded at base; middle cauline leaves flat, broadly linear above, oblong-lanceolate below, semiamplexicaul, 10-15(30) cm wide, abruptly narrowed toward apex, more or less undulate, sometimes involute; upper leaves wide, reduced, oblong or lanceolate-oblong in lower part, abruptly narrowed above, semiamplexicaul. Peduncles not thickened below capitula, 1-2(3) mm thick. Capitula



183 numerous on short peduncles in panicle inflorescence, 1.5–2(2.5) cm long at flowering, 2.5–3.5 cm long at fruiting. Involucral bracts 8–10, lanceolate, expanded at base, narrowed toward apex, distinctly shorter than florets and achenes—by (2)4–8 mm; florets light yellow. Peripheral achenes including pappus about 2.4 cm long, excluding pappus about 1 cm, brownish, curved, sulcate, indistinctly five-angled, finely squamose, scabrous, gradually narrowed into thick and short, indistinct, sulcate, squamose, 1–3 mm-long beak; pappus slightly longer than achene, or almost as long. Flowering June to July; fruiting July to August.

Steppe meadows, mountain slopes, sometimes forming thickets on wastelands.—*Soviet Central Asia*: Dzhungaria-Tarbagatai, Balkhash Region. Endemic. Described from vicinity of Lepsinsk. Type in Leningrad.

Note. Similar to *T. dubjanskyi*, Krasch. and S. Nikit., from which it is distinguished by the linear leaves and smaller capitula, as well as by the form and sculpture of the achenes.

Economic Importance. As a fodder plant relished by cattle.

64. ***T. ruthenicus*** Bess. ex Krasch. and S. Nikit. in Otch. Pochv.-Bot. Otr. Kazakhst. E'ksp. Akad. Nauk SSSR IV, 2 (1930) 292; in Izv. Glavn. Bot. Sada, XXIX, 487; Fl. Yugo-Vost. VI, 443; Pavlov, Fl. Tsentr. Kazakhst. III, 337; C. Rgl. in Scr. Hort. Bot. Univ. Vyt. Magni V, 43 and in Berechte Schweiz. Bot. Gesellsch. 65 (1955) Karte 1.—*T. villosum* auct. non L.: Pall. Reise V (1778) 332, p. p.—*T. canus* auct. non Willd.: Bess. Enum. Fl. Volh. (1822) 30.—*T. ruthenicus* subsp. *typicus* C. Rgl. op. cit. (1937) 43, 44; and op cit. (1955) Karte 1.—*Pteropogon ruthenicus* C.A.M. ex Claus in Goebel, Reise in d. Stepp. Südl. Russl. 2 T.(1838) 284, nomen nudum.—**Ic.:** S. Nikit. in Fl. Yugo-Vost. VI, 443, Fig. 715; C. Rgl. op. cit. (1937) Abb. 7, 18.

Biennial. Root robust, long, vertical; root collar densely covered with fibrous remnants of old leaves. Plants 30–80(115) cm high, flocculose-tomentose, especially above, on young branches and in leaf axils. Stems erect or slightly flexuous, usually robust, thick, highly sulcate, usually branched above, densely leafy from base, fistular below. Lower basal leaves usually expanded at base, 20–40 cm long, 4–12 mm wide, often folded, withering at seed maturation, acute; middle leaves semiamplexicaul, 9–15(18) cm long, expanded at base, 8–25 mm wide, gradually narrowed upward and glabrous in this part, conduplicate along keel, sometimes undulate; uppermost leaves reduced, 2–6 cm long, 6–10 mm wide at base, spatulate, narrowed above, with long, arcuate cusp, usually flocculose-tomentose. Peduncles not thickened below capitula, 1–2(3) mm thick. Capitula 3–30, at fruiting 20–40 mm long, 10–15 wide. Involucral bracts 7–12, at fruiting (18)25–35 mm long, 4–5 mm wide, more or less pubescent, especially very young ones, acuminate, glaucous from

flocculose tomentum, slightly shorter as long as florets but shorter than achenes; florets light yellow. Peripheral achenes 1.5–3 cm long with pappus, without pappus 1.2–1.5(2) cm, somewhat thick, about 1–1.5 mm wide, shallow-sulcate, with 8–12 alternating smooth and finely tuberculate ribs, straight or somewhat curved, without beak, sometimes smooth in upper part, not spinulose; pappus 1.5–1.8 cm long, as long as or longer than achene, sometimes reddish with hairy annulus at base. Flowering May to August (September).

Hummocky sands and slopes and in hollows, less often at the top of hummocks, dry sandy substrates, in river valleys.—*European Part*: Lower Volga, Lower Don;—*Soviet Central Asia*: Aralo-Caspian Region. Endemic. Described from Caspian steppes. Type in Leningrad.

Note. The species is close to *T. dubjankysi* Krasch. and S. Nikit., from which it differs by having less numerous (3–30, not 10–70) capitula, a smaller size, less branching, smaller involucre and achenes, leaves narrower at the base and flocculose-tomentum on the stem, leaves, and involucre.

Economic Importance. A fodder plant.

65. *T. donetzicus* Artemcz. in Tr. Inst. Bot. Khar'k. Univ. II (1937) 49; Klok. in Vizn. Rosl. URSR, 590; C. Rgl. in Berichte Schweiz. Bot. Gesellsch. 65 (1955) Karte 2.—**lc.**: Artemcz. op. cit. Fig. 6.

Biennial. Plants 10–40 cm high, more or less densely pubescent, densely flocculose below capitula and on young branches, Stems solitary, or sometimes several, often pyramidally branched from base. Upper leaves 20–35 mm long, not shorter than 15 mm, similar to middle cauline leaves, not involute; basal leaves expanded at base but narrower than cauline leaves, narrowly linear, about 3 mm wide, narrowed upward and folded; cauline leaves reduced, expanded at base, 6–7 mm wide, folded, sometimes flat, acute, deflexed and bent. Involucral bracts seven or eight, 15–20 mm long at fruiting, 5–10 mm wide, shorter than florets, with wide white stripe along margin, densely or sparsely pubescent, alternating with each other. Peduncles not thickened below capitula, 5–10 mm thick. Capitula at fruiting 10–19 mm wide; florets yellow. Achenes 10–14 mm long, gradually narrowed toward apex, weakly scabrous; peripheral achenes sparsely pubescent, without or almost without beak; pappus reddish-gray, 10–11 mm long, with glabrous, annulus at base. Flowering June to September.

Sands in river valleys, dry sands, and less often in steppe areas.—*European Part*: ? Black Sea Region, Lower Don (middle reaches of Donets). Endemic. Described from Kharkov Region near village of Ilichevka. Type in Kiev.

Note. It differs from *T. tanaiticus* Artemcz. by having a shorter stem,

narrower leaves and a glabrous, thickened annulus at the base of the pappus. From *T. ucrainicus* Artemcz. it differs by having beakless achenes.

Section 15. Chromopappus Boriss. sect. nova in Addenda XXVIII, 725.— Peduncles clavately thickened below capitula, short; capitula large; involucre bracts six to eight, one and one-half to two times as long as
185 florets; florets purple, pinkish, or violet; achenes with somewhat thick, straight, almost smooth beak, longer or slightly shorter than gradually or abruptly expanded body of achene; pappus colored, dirty violet, almost as long as achene. Biennial plants.

Type of section: *T. coloratus* C.A.M.

66. **T. coloratus** C.A.M. Verzeichn. Pfl. Cauc.(1831) 61; DC. Prodr. VII, 12; Ldb. Fl. Ross. II, 2, 785; Boiss. Fl. or. III, 746; Grossh. Fl. Kavk. IV, 230; Kuthath. in Fl. Gruzii VIII, 620; Kavk. Predst. Tragop. (1957) 41; in Fl. Azerb. VIII, 508; Kitam. Fl. Afghan. (1960) 452.—*T. ruber* auct. non S.G. Gmel.: Grossh. Fl. Kavk. (1934) 230.—**lc.**: Kuthath. op. cit. (1957) Plate V, Fig. 10, Map 7.

Biennial. Root vertical, thick, sometimes branched; root collar covered with remnants of old leaves. Plants 7–30(60) cm high. Stems glabrous, densely leafy, branched or simple, erect. Basal leaves long, narrow; cauline leaves semiamplexicaul, expanded at base, flat, lanceolate-linear or narrowly linear, long-acuminate, undulate, often exceeding peduncles. Peduncles, especially at fruiting, strongly clavately thickened, short, often drawn out below capitula. Capitula solitary on each peduncle, 4–4.5 cm long on fruiting. Involucre bracts six to eight lanceolate-linear, narrowed towards apex, acuminate, expanded at base, and membranous along margin, especially at fruiting; florets purple, pinkish, or violet, half to two-thirds as long as involucre. Achenes including pappus 5.3 cm, excluding pappus 2.7 cm long; body of achene 1.5 cm long, finely sulcate, with 10 ribs, scabrous from small dense scales or tubercles; gradually narrowed into somewhat thick, 1.2 cm-long, straight, glabrous, almost smooth beak, without hairy annulus at apex and clavately thickened; pappus 2.4 cm long, dirty violet, with few longer hairs, almost as long as achene with beak. Flowering May to June; fruiting June to July.

Dry grassy and stony slopes in lower and middle mountain zones.—*Caucasus*: Eastern and Southern Transcaucasia, Talysh. *General distribution*: Balkans-Asia Minor, Iran. Described from Zuvant. Type in Leningrad.

Note. In the Nakhichevan ASSR, var. *floccosus* Sosn. (Kuthath. [1957] Kavk. Predst. Tragop., 42), with flocculose stem and leaves, is recognized.

67. **T. nachitschevanicus** Kuthath. in Zam. po Sist. i Geogr. Rast.

Tbil. 15 (1949) 96; Kavk. Predst. Tragop. (1957) 59; in Fl. Azerb. VIII, 511.—**Ис.**: Kuthath. op. cit. (1957) Plate IX, Fig. 30, Map 10.

Biennial. Root vertical; root collar often covered with remnants of previous year's leaves. Plants glabrous, 40(60) cm high. Stem erect, branched, densely leafy, finely sulcate. Lower leaves expanded at base, semialexicaul, abruptly narrowed, long-acuminate; cauline leaves up to 2 cm wide at base; all leaves narrowed toward apex, long-acuminate, semialexicaul. Capitula up to 7 cm long, solitary. Peduncles strongly thickened upward; involucre bracts six to eight, expanded at base, long-acuminate, longer than achenes including pappus, at base glabrous; florets purple. Peripheral achenes large, somewhat curved, about 6 cm long with pappus, 3.2 cm long without pappus; body of achene about 1.3 cm long, 3 mm wide, with three grooves on outer side and two on inner, with five prominent, sometimes winged, squamose-tuberculate ribs, at apex abruptly narrowed into smooth, white, somewhat thick, five-angular, 1.9 cm-long beak, one and one-half times as long as body of achene, somewhat thickened at apex, not clavate, with hairy annulus; pappus 2.7 cm long, purple above, hairs unequal. Inner achenes larger, quite different from outer, straight, shallow-sulcate, finely transversely squamose; body of achene gradually narrowed into long beak. Flowering May to June; fruiting May to July.

Screes and gravelly slopes in the middle mountain zone.—*Caucasus*: Southern Transcaucasia, Talysh. Endemic. Described from Nakhichevan ASSR, village of Saltakh. Type in Leningrad; isotype in Tbilisi.

Section 16. Rubriflori Boiss. Fl. or. III (1875) 745, p. p.—*set. Collini* Kuthath. Kavk. Predst. Tragop. (1957) 25, p. p.—Peduncles below capitula not thickened, weakly or somewhat strongly thickened; capitula solitary, medium to large, on long straight peduncles; involucre bracts 8–10, shorter or almost as long as ligulate florets; florets purple, pink, or violet; achenes thicker below, tuberculate-squamose, sulcate, sometimes almost winged, gradually narrowed into somewhat thick, straight beak; pappus as long as or slightly shorter or longer than achenes; plants perennial, weakly branched, 5–40 cm high, usually with numerous leaves crowded in basal part; roots cylindrical, thick.

Type of section: *T. ruber* S.G. Gmel.

Series 1. Collini (Kuthath.) Boriss. comb. nov.—*sect. Collini* Kuthath. Kavk. Predst. Tragop. (1957) 25, p. p. Short, 5–25 cm high, plants. Peduncles not thickened; involucre bracts eight, usually shorter or almost as long as florets; capitula large, 4.5–4.8 cm long at fruiting, solitary; florets pink, reddish, or purple; achenes with thick, almost smooth beak, gradually broadened into sharply scabrous body of achene; pappus sometimes dirty violet, shorter than achene.

68. *T. collinus* DC. Prodr. VII (1838) 115; Ldb. Fl. Ross. II, 2, 789; Boiss. Fl. or. III, 746 (excl. syn. *T. marginatum* Boiss. and Buhse); Grossh. Fl. Kavk. IV, 230; Rech. f. Symb. Afghan. II, 189; Kuthath. Kavk. Predst. Tragop. (1957) 28; in Fl. Azerb. VIII (1961) 505; Kitam. Fl. Afghan. 187 (1960) 452.—*T. roseus* auct. fl. cauc. non Trevir.: C.A.M. Verzeichn. Pfl. Cauc. (1831) 61.—*T. mutabile* auct. fl. cauc. non Trevir.: Hohen. in Bull. Soc. Nat. Mosc. XI(1838) 273.—*Id.*: Rech. op. cit. fig. 128; Kuthath. op. cit. (1957), Plate III, Fig. 11, Map 4.

Perennial or biennial. Root cylindrical, vertical, thick; root collar covered with fibers and remnants of old leaves. Plants flocculose, glaucous. Stems, 5–25 cm tall, solitary, simple, less often weakly branched, usually each with solitary capitulum, densely leafy. Basal leaves numerous, expanded at base, semiamplexicaul, lanceolate-linear or filiform, flat or undulate and involute, gradually narrowed upward, with white border, almost as long as stem or sometimes slightly longer; cauline leaves whitish toward base and expanded into sheath, lanceolate-linear, undulate, usually curved. Peduncles not thickened below capitula. Involucral bracts eight, shorter or almost as long as florets, narrowly lanceolate; capitula 2.5–3 cm long at flowering, 4.5–4.8 cm long at fruiting; florets pink, reddish, or purple, usually longer than involucre, Achenes with pappus 4.8 cm long, 2.5 cm without; body of achene excluding beak 1.5 cm long, about 2 mm wide, scabrous and with sharp ribs in middle, smooth below, gradually narrowed above into thick, about 1 cm-long, smooth beak two-thirds as long as body of achene, without apical thickening and hairy annulus; pappus 1.8–2 cm long, usually dirty violet. Flowering April to May; fruiting May to June.

Dry slopes of hills, dry stony slopes, and coastal sands.—*Caucasus*: Eastern and Southern Transcaucasia. *General distribution*: Iran, northwestern Afghanistan. Described from vicinity of Baku. Lectotype in Leningrad.

Note. Kuthatheladze (op. cit, recognizes var. *coeruleus*, Kuthath, with light blue ligulate florets, which are much longer than the involucral bracts; plant collected from Zuvant. *T. collinus* DC. differs from *T. ruber* Gmel., described from the vicinity of Astrakhan, by having involucral bracts that are half as long as the florets. It also differs from *T. mutabile* Jacq. by having a more dense pubescence, undulate leaves, and smaller size. The report of *T. collinus* DC. for Alai probably relates to *T. alaicus* S. Nikit.

Series 2. Rubri Boriss.—Peduncles not thickened or weakly thickened at fruiting; capitula solitary at apices of stem and branch; 4–6 cm long; involucral bracts 8–10, usually shorter than florets; achenes with somewhat thick, sulcate beak, gradually or abruptly expanded into thicker sharply

scabrous and deeply sulcate, sometimes winged, body of achene, longer than beak; pappus yellowish or dirty violet. as long or slightly longer than achene.

69. **T. ruber** S.G. Gmel. Reise II (1774) 198; DC. Prodr. VII, 114; Boiss. Fl. or. 746; Ldb. Fl. Ross. II, 2, 789; S. Nikit. Fl. Yugo-Vost. VI, 445; Schmalh. Fl. II, 145; Pavlov, Fl. Tsentr. Kazakhst. III, 336; C. Rgl. 188 in Berichte Schweiz. Bot. Gesellschaft. 65 (1955) Karte 2.—*T. mutabile* auct. fl. ross. non Jacq.: Schmalh. op. cit. 145.—*T. roseus* Trevir. in Mag. Ges. Natutf. Fr. Berl. VII (1816) 152.— **Ic.**: Ldb. Ic. fl. ross. I, t. 30.

Perennial. Root vertical, cylindrical, robust; root collar covered with old leaves. Plants 8–25(40) cm high, glaucous, young plants arachnoid, later glabrous and dark glaucous. Stems straight, erect, branched below or simple, flocculose-tomentose in leaf axils and below capitula. Basal and lower leaves linear, 10–20 cm long, (5)7–15(20) mm wide, expanded at base; cauline leaves lanceolate, all entire; middle leaves shorter and broader than lower, lanceolate or linear-lanceolate, with broad semiamplexicaul base, more or less undulate, less often almost flat, acuminate and sometimes involute, scarious along margin. Peduncles long, at fruiting not or weakly thickened, 2–4(7) mm in thick. Capitula solitary at apices of stem and branch, large, 4.5–6 cm long at fruiting, 3–5 mm long at flowering; involucre of 8–10 bracts, shorter or almost as long as florets and achenes. Involucral bracts 8–12 mm wide, 25–30 mm long, arachnoid-flocculose, glabrescent, smooth, lanceolate, long-acuminate. Florets pink-violet, purple, or light violet; peripheral florets one and one-half times as long as involucre. Peripheral achenes with pappus 4–5 cm long, exceeding involucre, without pappus 2.1–2.15 cm long; body of achene 1.4–1.6 cm long, about 1.5 mm wide, sulcate, densely covered with white, obtuse scales, sometimes weakly sculptured, gradually narrowed into somewhat thick, sulcate beak weakly squamose below, shorter than achene, 0.7–1.0 cm long, without apical swelling; pappus dirty violet or yellowish, about 2.5 cm long, almost as long as achene including beak, usually without hairy annulus at base. Flowering April to June; fruiting May to August (Plate XI, Fig. 2).

Sandy and clayey steppe areas, gentle and stony slopes in desert-steppe zone; now and then on scarps, sands, dry sunny slopes, sometimes a weed in gardens—*European Part*: Lower Volga; *Soviet Central Asia*: ? Aralo-Caspian, Balkhash Region; *Western Siberia*: Irtysh. *General distribution*: ? Dzhungaria-Kashgaria. Described from vicinity of Astrakhan. Type lost.

70. **T. marginifolius** Pavl. in Byull. Mosk. Obshch. Isp. Prir. XLVII, 2 (4 II 1938) 83; Pavlov in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR,

IX, 2 (1941) 52; Kovalevskaja in Fl. Uzb. VI, 432. — *T. gonocarpum* S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (22 V 1938) 266.—*T. gonocarpus* (S. Nikit.) Stank. in Stank i Tal. Opred. Vyssh. Rast. (1949) 688. —*T. marginatum* Pavl. in Byull. Mosk. Obshch. Isp. Prir. XLII, 2 (1933) 135, non Boiss. and Buhse (1860).—*T. abolinii* ssp. *gonocarpum* S. Nikit. in Fl. Yugo-Vost. VI (1936) 445.—*T. abolinii* M. Pop. and Vved. ex C. Rgl. in Berichte Schw. Bot. Gesellsch. 65 (1995) Karte 2 nom.—**!c.**: Pavlov, op. cit. (1933) Fig. 2; Kovalevskaja, op. cit. Plate XLIII, Fig. 4.

- 189 Perennial. Tap root vertical, thick. Plants 10–40 cm high, branched from base or middle or stems simple, young branches sometimes reddish, glaucous, sometimes flocculose-tomentose, glabrescent, Stem rather thick, sulcate, glabrous. Basal and cauline leaves broadly lanceolate, 10–20(30) mm wide, their maximum width below middle, semiamplexicaul, many-veined, often with undulate cartilaginous whitish border, more or less undulate, somewhat attenuate toward apex, thin; upper leaves reduced, oblong-lanceolate to ovate-oblong. Peduncles below fertile capitula weakly thickened or not, 3–5(7) mm thick, fistular. Capitula solitary, large, 20–40 mm long at flowering, 40–60 mm at fruiting. Involucral bracts eight, lanceolate, with more or less prominent midrib, acuminate, shorter than florets and achenes; florets pink-violet. Peripheral achenes with pappus about 4 cm long, without pappus about 2 cm, sharply five-angled and sulcate, imbricate-squamose, sometimes winged along ribs, yellowish, abruptly narrowed into somewhat thick, angular, ribbed, about 6 mm-long beak, sharply squamose below and one-third to half as long as achene, less often as long, not swollen at apex; pappus about 2.5 cm long, yellowish or reddish-brown, somewhat longer or almost as long as achene with beak. $2n = 12$. Flowering May to June; fruiting June to July.

Stony peaks and screes on dry south slopes, in semidesert, on butte-like elevations. *European Part*: Lower Volga (Bogdo, Chopchachi); *Soviet Central Asia*: Aralo-Caspian Region (Mugodzhary, Lake Inder, Aktau, Emba River, Ust-Urt near Aral Sea), Balkhash Region (Chu-Ili Mountains); Tien Shan (Talass Alatau, Karatau Range). Endemic. Described from Boroldai Mountains (Karatau Range). Type in Moscow.

Note. It differs from *T. ruber* S.G. Gmel. by having acutely angular, deeply sulcate, wing-ribbed achenes, cartilaginously bordered leaves, and shorter involucral bracts at fruiting.

71. ***T. conduplicatus*** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VI 12 (1937) 265.—*T. rubrum* auct. fl. turkest. ex parte non S.G. Gmel.

Perennial. Stem slender, short, 10–17 cm long, simple or branched below, solitary. Lower leaves narrowly linear, flat, conduplicate; middle

leaves strongly expanded at base 3–6(12) mm wide, semiamplexicaul, narrowed into about 10 cm long, linear-lanceolate lamina, usually conduplicate; upper leaves undeveloped or reduced. Peduncles not thickened below fertile capitula, 2–3 mm thick. Capitula at fruiting 30–40 mm wide. Involucral bracts eight, noticeably shorter than florets and achenes, less often longer than florets; involucral bracts 2–3 cm long, linear-lanceolate, acuminate; florets pink, violet on drying. Peripheral achenes about 4.5 cm long, excluding pappus 2.2 cm, five-angled, deeply sulcate distinctly sculptured, obtusely squamose throughout, gradually narrowed into about 5 mm-long, somewhat thick, sulcate beak, without swollen apex and stripes, smooth above; pappus about 25 mm long, as long as achene or with beak slightly longer. Flowering May to July; fruiting May to August.

Rare on stony and rubbly mountain slopes.—*Soviet Central Asia*: Pamiro-Alai, mountainous Turkmenia. Endemic. Described from Zeravshan Range. Type in Leningrad.

Note. It differs from *T. ruber* S.G. Gmel. by having narrow, mostly folded leaves, straight and very long, deeply sulcate achenes, and slender stems. The involucre in the Kopetdag specimens exceed the florets, and the leaves are long, filiform-linear.

72. ***T. montanus*** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937) 270. —*T. rubrum* auct. fl. turkest., non S.G. Gmel. pro parte.

Perennial. Stems thick, sulcate, usually branched only below, densely leafy, 25–30 cm high. Leaves straight, flat, wide, many-veined; lower leaves linear, middle ones linear-lanceolate, long-acuminate, (5)7–15(20) mm wide below, semiamplexicaul. Peduncles fistular below fertile capitula, not thickened, 3–5 mm thick, sometimes weakly thickened up to 7 mm. Capitula 30–40(50) mm long with florets, 4.5–5.5(6) cm long at fruiting, Involucre of eight bracts, slightly shorter or almost as long as florets and achenes; involucral bracts lanceolate, acuminate, about 4 cm long; florets pink-violet. Peripheral achenes about 5 cm long, excluding pappus 2.5 cm long, without beak 1.5 cm long, obtusely five-angled, deeply sulcate, obtusely squamose-scabrous above, usually indistinctly sculptured below, gradually narrowed into about 1 cm-long, thick, sulcate beak, shorter than achene, without apical swelling; pappus about 2 cm long, almost as long as achene including beak. Flowering May; fruiting May to June.

Single plants found on dry stony slopes.—*Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan, Pamiro-Alai, mountainous Turkmenia. *General distribution*: Possibly occurring in neighboring parts of Iran. Described from Tien Shan. Type in Leningrad.

Note. S. Nikitin (op. cit. 271) segregates *T. montanus* ssp. *tianschanicus* S. Nikit., which is characterized by the involucre bracts being shorter than the pink-violet florets and the achenes, remote leaves, a sometimes shortened stem, the color of the corolla, and a pappus shorter than the achene.

Series 3. *Longipapposi* Boriss.—Peduncles not thickened; capitula large and medium, 4–6 mm long at fruiting; involucre bracts eight, shorter than florets and achenes; florets pink-violet; achenes with somewhat slender beak gradually widening to body, beak half to two-thirds as long as achene; pappus much longer than achene with beak.

- 191 73. ***T. alaicus*** S. Nikit. in Bot. Mat. Gerb. Bot. Inst Akad. Nauk SSSR VII, 12 (1937) 268.—*T. rubrum* auct. fl. As. Med non S.G. Gmel.—*T. collinus* auct.: B. Fedtsch. Rast. Turk. (1995) 760.

Perennial. Plants 40–60 cm high; stem sulcate, branched below. Leaves narrowly linear to linear-lanceolate; upper leaves reduced, 3–5 cm long, broader in lower part, with oblong-elliptical base, 5–7(12) mm wide, acuminate, more or less finely scarious along margin, sometimes slightly undulate. Peduncles with capitula not thickened, 2–3 mm thick. Capitula about 4–5 cm long at fruiting. Involucre bracts eight, lanceolate-linear, long-acuminate, somewhat shorter than florets and achenes, about 3 cm long, about 4 mm wide at base; florets pink-violet longer than involucre bracts. Peripheral achenes with pappus about 5.8 cm long, excluding pappus 2.7 cm, about 1.5–2 cm long without beak, shallow-sulcate to ribbed and finely and imbricately squamose, gradually narrowed into white, about 0.7–1.2 cm-long, almost smooth beak finely sulcate at base, not thickened at apex and with hairy annulus at pappus base; pappus yellowish-white, about 3 cm-long, longer than achene including beak. Flowering May to June; fruiting June to July.

Mountain slopes.—*Soviet Central Asia*: Pamiro-Alai (Alai Range). Endemic. Described from Alai Range between Chirchik and Gulcha in Kirgizia. Type in Leningrad.

Note. It differs from *T. ruber* S.G. Gmel. by the shape of the leaves, the involucre being shorter than the florets and the achenes, and the pappus being longer than the achenes, as well as by the shape and sculpture of the achenes.

74. ***T. gaudanicus*** Boriss. in Fl. Turkm. VII (1960) 298, 381—*T. rubrum* auct. fl. As. Med. non S.G'. Gmel.—**lc.**: Fl. Turkm. VII, Plate XLV, Fig. 2.

Perennial or biennial. Root virgate, weak, slightly thickened in upper

part; root collar covered with remnants of old leaves. Plant short, glabrous. Stems 10–25 cm high, slender, somewhat ascending, simple or weakly branched, densely leafy. Cauline leaves lanceolate or oblong-lanceolate, with maximum width in lower third, up to 1 cm wide, semiamplexicaul, acuminate. Peduncles exceeding leaves, 3–10 cm long, not thickened below capitula, glabrous, finely sulcate. Capitula solitary at apices of stems about 2.5 cm long at flowering, about 5 cm long at fruiting, narrow, about 1 cm wide. Involucre of eight lanceolate, acuminate bracts, not longer than florets and achenes; florets violet. Achenes about 5 cm long, excluding pappus but including beak about 2 cm long; beak about 1 cm long, slender, as long as body of achene, finely sulcate; weakly scabrous at base; achenes sulcate and scabrous from very small sparse scales; pappus about 3 cm long, dirty yellow, with intertwined hairs at base. Flowering April to May; fruiting May.

- 192 Dry stony mountain slopes.— *Soviet Central Asia*: mountainous Turkmenia. *General distribution*: may occur in Iran. Described from Kopetdag Range. Type in Leningrad.

Note. It differs from *T. montanus* S. Nikit. by the better developed stem and the leaves, which are not crowded at the base of the stem, the form and sculpture of the achenes, and the relationship of the length of the achene, pappus, and beak. In the *Flora of Turkmenia* errors have crept in, and the lines are mixed up in the description of *T. gaudanicus* Boriss.

Series 4. Brevipapposi Boriss. Peduncles not thickened; capitula solitary, on erect peduncles, 3.5–4 cm long at fruiting, 2–3 cm long with florets; involucre bracts eight, shorter than florets and achenes; florets pinkish violet; achenes with somewhat thick, almost smooth beak, with distinct deeply sulcate and sharply squamose body; pappus reddish-brown, densely plumose-hairy, shorter than achene; stems rather tall, slender.

75. *T. elongatus* S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937) 269; Karyl. Fl. Zap. Sib. XI, 2974.—*T. rubrum* auct.; mult. non S.G. Gmel. p. p.

Perennial. Plant 10–35 cm high. Root virgate, vertical, thickened; root collar usually branched, covered with remnants of previous year's leaves. Stems slender, sulcate, erect, or weakly flexuous, simple or branched from base. Leaves erect, linear, oblong; middle cauline leaves rhomboidal below 5–8(10) mm wide, narrowed into narrowly linear lamina above, narrowly scarious along margin; upper leaves reduced. Peduncles not thickened below capitula, 2–4 mm thick. Capitula 2–3 cm long at flowering, 3.5–4 cm at fruiting. Involucre of eight bracts, shorter than florets and achenes; florets pinkish-violet. Peripheral achenes almost



straight, 3.5–3.7 cm long including pappus, 2 cm long without pappus, about 2 mm wide, about 1.3 cm long excluding beak, obtusely five-angled, sulcate, with acute and dense small tubercles or scales, narrowed into sulcate, ribbed, somewhat thick, almost smooth, about 0.7 cm-long beak, with hairy annulus at apex; pappus brownish, with dense long hairs, shorter than achenes including beak, 1.6–1.8 cm long. Flowering May to June; fruiting June to July.

Mountain slopes, in steppe vegetation on sandy-gravelly, clayey and stony soils.—*Western Siberia*: Irtysh; *Soviet Central Asia*: Balkhash Region (Zaisan Kettle hole, Dzhungaria-Tarbagatai, Tien Shan. *General distribution*: Dzhungaria-Kashgaria. Described from vicinity of village of Kenderlyk in Zaisan Kettle hole. Type in Leningrad.

Note. It differs from *T. ruber* S.G. Gmel. by having linear, straight, elongated leaves, that are basally rhomboidal and very narrow above; involucre bracts shorter than the florets and the achenes; a reddish-brown, densely plumose pappus that is shorter than the achene, and tall stems.

Series 5. Asiatici Boriss. Peduncles more or less thickened; plants short, densely leafy in basal part; capitula 4–6 mm long; involucre bracts eight, almost as long as florets but shorter than achenes; achenes with somewhat thick smooth beak, almost as long as or shorter than body of achene; pappus brownish-red or yellowish, almost as long as achene.

76. *T. malikus* S. Nikit. i Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1938) 267.—Zakir. Fl. i Rast. Zeravsh. 2, 419; Kovalevskaja in Fl. Uzb. VI, 431.—*T. ruber* var. *latifolius* M. Pop. and Vved. ex Lapin, Opr. Rast. Tashkent. Oazisa I (1933) 114.—*T. latifolius* M. Pop. in Tr. Uzb. Gos. Univ. N. S. 27, Biol. 14 (1941) 94; Zakir. op. cit. 420.—*T. rubrum* auct. fl. turk. pro parte, non S.G. Gmel.—**!c.**: Kovalevskaja in Fl. Uzb. Plate XLIII, Fig. 2.

Perennial. Root cylindrical; root collar covered with remnants of old leaves. Plants glabrous, glaucous-green, 20–30 cm high. Stems branched or simple. sulcate, with short internodes, rather densely leafy. Basal leaves linear, not longer than inflorescence, hairy along margin, thin acuminate; middle cauline leaves narrow, linear-lanceolate, with maximum width in lower part, 5–10, very rarely 20 mm wide, slightly narrowed near base, more or less sinuate and scarious along margin; upper leaves linear-lanceolate to lanceolate and oblong, base up to 10–20 mm, much shorter than basal and lower cauline leaves, thin-acuminate. Peduncles strongly leafy, somewhat thickened below fertile capitula, 3–4(5) mm thick. Capitula large, cylindrical, 40–60 mm long at fruiting, 15–20 mm wide (dry). Involucre bracts lanceolate, acuminate, with broad bases, almost as long as florets but shorter than achenes with pappus, pubescent at base

at fruiting, also pubescent at apex at flowering; florets pink-violet. Peripheral achenes straight, with pappus about 5 cm long, without pappus 2.6 cm long, body of achene about 1.5 cm long, five-angled, sulcate, finely and sharply squamose, sometimes weakly sulcate, gradually narrowed into somewhat thick, smooth or weakly sulcate, about 1.5 cm-long beak, not swollen at apex below pappus and with hairy annulus; pappus about 2 cm long, its individual hairs not plumose, up to 2.4 cm long, reddish-brown with violet tinge, densely plumose-villous. Flowering April to May; fruiting May to June.

Foothill zone.—*Soviet Central Asia*: Pamiro-Alai (Karatau, Malik, Pitalitau mountains). Endemic. Described from Mt. Malik. Type in Tashkent.

Note. It differs from *T. marginifolius* Pavl. by its narrow leaves, cylindrical capitula, and straight achenes.

- 195 77. **T. kultiassovii** M. Pop. ex S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1938) 265; Kovalevskaja in Fl. Uzb. VI, 431; Zakir. Fl. i Rast. Zeravsh. 2, 419.—*T. ruber* auct. fl. As. Med.: Kovalevskaja, op. cit. Plate XLIII, Fig. 3.

Perennial. Root robust, vertical, cylindrical. Plants glaucous-green, 10–30 cm high, usually branched from base. Stems thick, sulcate. Leaves broadly lanceolate, 10–15(20) mm wide in middle, usually recurved, undulate and scarious along margin, flocculose in leaf axils. Peduncles clavately thickened below capitula at fruiting, 4–6(8) mm thick. Capitula 20–35 mm long at flowering. Involucral bracts eight, almost as long as florets; dry florets pinkish-violet. Achenes including pappus 3–6 cm and without pappus 1.8 cm long; body of achene about 1 cm long, finely sulcate and finely tuberculate, curved, gradually narrowed into about 0.8 cm-long, thick beak; beak sulcate and finely tuberculate in lower half, not swollen at apex and without hairy annulus; pappus 1.8 cm long, as long as achene, light yellowish. Flowering April.

Slopes of foothills. *Soviet Central Asia*: Syr-Darya, Pamiro-Alai (central Zeravshan, according to Zakirov). Endemic. Described from Fergana, vicinity of Santo. Type in Tashkent.

Note. It differs from *T. malicus* S. Nikit. by having peduncles that are very strongly thickened at flowering, and also recurved and undulate leaves.

78. **T. kasahstanicus** S. Nikit. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR VII, 12 (1937) 268.—*T. rubrum* auct. fl. turk. pro parte, non S.G. Gmel.

Perennial. Plants grayish-green, up to 30 cm high. Stems branched below, with isolated flocculose flakes at leaf bases and below fertile

capitula. Middle leaves expanded at base up to 5–12(20) mm, semiamplexicaul, narrowed upward into narrowly linear or linear-lanceolate lamina, usually narrowly membranous along margin, sometimes sinuate and conduplicate. Peduncles more or less thickened below fertile capitula, (3)4–7 (sometimes up to 10) mm thick, fistular. Capitula about 3 cm long at flowering, 4–5(6) cm long at fruiting. Involucral bracts eight, as long or almost as long as florets and achenes; florets pink-violet. Peripheral achenes straight or slightly curved, about 5 cm long, excluding pappus 2.5 cm long; body of achene 1.5 cm long, five-angled, with dense obtuse scales, sulcate above, gradually narrowed into somewhat thick, white, scabrous-sulcate and squamose, about 1 cm-long, basally smooth beak; beak almost one-third as long as achene, slightly swollen at apex; tomentose below pappus; pappus almost as long as achene, about 2.5 cm long, dirty white or yellowish; inner achenes not sculptured. Flowering May; fruiting June. (Plate VIII, Fig. 3.)

- 196 Sandy deserts.—*European Part*: Lower Volga (Astrakhan, Lake Inder); *Soviet Central Asia*: Aralo-Caspian, Dzhungaria-Tarbagatai, Balkhash Region, Tien Shan, Syr-Darya. *General distribution*: Dzhungaria-Kashgaria. Described from sandy deserts in valley of Kurtsu River, a tributary of Ili River. Type in Leningrad.

Economic Importance. A good food and fodder plant.

Note. It differs from *T. ruber* S.G. Gmel. by having larger capitula, involucre almost equaling the florets and achenes, as well as peduncles that are thickened at fruiting. It differs from *T. montanus* S. Nikit. by having the middle cauline leaves expanded at the base and drawn out into a narrow lamina, a peduncle thickened below the capitula at fruiting, as well as by the pubescence and range.

Section 17. *Hebecarpus* Boriss. in Addenda XXVIII, 725.—Peduncles thickened below capitula, fistular; involucral bracts eight, less often five, longer than or as long as florets; capitula large, 5–8 cm long; florets purple or violet; outer achenes straight, brownish, with straight, somewhat thick, smooth beak, gradually widening into squamose-tuberculate body of achene, almost as long beak; pappus more or less as long as achene. Large annuals or biennials.

Type of section: *T. porrifolius* L.

79. ***T. porrifolius*** L. Sp. pl. (1753) 789; DC. Prodr. VII, 112; Ldb. Fl. Ross. II, 2, 785; Boiss. Fl. or. III, 745; Schmalh. Fl. II, 147 (*T. parvifolium* L.—sphalm.); Fedtsch. and Fler. Fl. Evrop. Ross. 1042.

Annual or biennial. Root vertical, cylindrical, strong; root collar not covered with fibers. Stems simple or branched, glabrous or sparsely

pubescent, (30)60–125 cm high, thick. Leaves flat, linear-lanceolate, expanded at base, semiamplexicaul, straight, erect, acuminate. Peduncles thickened below capitula, tubular, fistular. Capitula 5–8 cm long, solitary, on long peduncles; involucre bracts eight, less often five, longer than or as long as florets, deflexed; florets purple or violet-red. Achenes straight, brownish; peripheral achenes squamose-tuberculate, gradually narrowed into straight, somewhat thick, smooth beak in broader body, apically extended into beak without thickening, almost as long as body of achene; pappus dirty white, more or less as long as achene with beak or slightly shorter, with hairy annulus at base. Flowering May to August.

Cultivated for its edible roots, and sometimes growing wild.—*European Part*: Reported from Baltic Region (Lithuania, Latvia), Central Russian districts, Crimea and Lower Volga. *General distribution*: Central Europe, Atlantic Europe, Mediterranean Region, Balkans-Asia Minor.

Note. The report of this species from the vicinity of Lake Inder probably relates to *T. ruber* s. 1.

GENUS 1638. *Geropogon* L.^{1,2}

L. Sp. pl. ed. 2 (1763) 1109.

Capitula less numerous, solitary, at apices of main stems, large, often numerous. Peduncle fistular, weakly thickened or not below capitula. Involucre of one row of similar or somewhat similar, usually remote bracts, 3–4 cm long at fruiting, two times as long as florets; involucre bracts five to eight, straight, upward-spreading, linear or linear-lanceolate, herbaceous. Receptacle alveolate, ciliolate-ciliate from linear-subulate scales. Florets ligulate, pink or violet. Achenes straight, thin, roundish in cross section, scabrous, gradually narrowed into long straight beak as long as body of achene or two times as long, pappus half to two-thirds as long as achene; pappus different in different achenes: outer achenes with five erect, persistent, sharply scabrous, hard bristles; inner achenes with soft plumose deciduous bristles, without hairy annulus at base. Annuals or biennials with straight, usually unbranched stem, and narrowly linear, basally semiamplexicaul leaves.

Type of genus: *Geropogon hybridus* (L.) Sch. Bip.

A monotypic Mediterranean genus.

1. *G. hybridus* (L.) Sch. Bip. in Webb. and Berth. Phyt. Canar. II

¹ Treatment by A.G. Borissova.

² From the Greek words *geron*—old man, and *pogon*—beard; named on the basis of the white sericeous pubescence of the achene.

(1836) 471.—*G. glabrum* L. Sp. pl. ed. 2 (1763) 1109; Willd. Sp. pl. 3, 1491, Pall. Ind. taur. 316; DC. Prodr. VIII, 111; Ldb. Fl. Ross. II 784; Boiss. Fl. or. III, 744; Grossh. Fl. Kavk. IV, 233; Kuthath. in Fl. Gruzii VIII, 636; Askerova in Fl. Azerb. VIII, 513. *G. hirsutum* L. Sp. pl. ed. 2 (1763) 1109; Willd. 1. c.—*G. australis* Spreng. Syst. Veg. 3 (1826) 663.—*Tragopogon hybridum* L. Sp. pl. ed. I (1753) 789.—*T. crocifolium* auct. non L.: DC. Prodr. VII, 114, p. p.; Ldb. Fl. Ross. 3, 788, p. p.; Schmalh. Fl. II, 147.—*T. hirsutus* (L.) Tard. Ess. hist. natur. Bessar. (1841) 60.—**1c.**: Jacq. Hort. Vindob. t. 33.

Annual. Root straight, virgate. Plants glabrous or weakly pubescent. Stems, 20–50(80) cm high, erect, usually simple, less often weakly branched, cylindrical. Leaves narrowly linear, long, erect, entire, acuminate, glabrous or pubescent at base, semiamplexicaul; lower leaves expanded at base. Peduncles hairy or glabrous below capitula, not or weakly thickened at fruiting, fistular. Capitula solitary, about 5 cm long, 1 cm wide. Involucre almost two times as long as florets. Involucral bracts eight, less often five or six, narrow, linear or linear-lanceolate, acuminate, 198 glabrous, 3–4 cm long at fruiting; florets pink or violet. Achenes including pappus about 5 cm long, without pappus 2.9–3.3 cm, almost roundish in cross section, linear-terete, straight, shallow sulcate, smooth below, sharply scabrous in middle and above, covered with rows of fine upward-spreading bristles; lower, broader body of achene gradually and imperceptibly narrowed into straight, stiff, rugose, about 1.5 cm-long beak; pappus of outer achenes of few subulate, sharp-toothed, scabrous, persistent, about 2 cm long bristles; pappus of inner achenes comprising plumose, soft, deciduous hairs much shorter than achenes. Flowering April to June; fruiting May to June. (Plate VIII, Fig. 2.)

Meadows of the lower mountain zone and plains, semideserts, among undergrowth in orchards, roadsides and fields.—*European Part*: Crimea, ?Bessarabia; *Caucasus*: Eastern Transcaucasia, Talysh. *General distribution*: Mediterranean Region, Canary Islands, Madeira, Northern Africa. Described from Italy. Type in London.

Subtribe 4. **HYPOCHAERINAE** Less. Synops. Compos. (1832) 130 (“Hypochaerideae”); DC. Prodr. VII, 1 (1838) 90; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 222, p. p.—Trib. Lactuceae sect. 1 *Archetypae* Cass. in Dict. sc. nat. XXV (1822) 60, p. min. p.; sect. 2. *Crepideae* Cass. op. cit. 61, p. min. p.; sect. 4. *Scorzonereae* Cass. op. cit. 64, p. min. p.—*Lactucées* sect. 1. *Prototypes* II. *Urospermées* Cass. in Dict. sc. nat. XLVIII (1827) 422; sect. 2. *Crépidees* Cass. Ibid., p. min. p.; Sect. 4. *Scorzonérées* Cass. Ibid., p. min. p.—Subtrib. *Scorzonereae* Dum. Fl. Belg. (1827) 63, p. p.—Trib. Cichorieae b) *Scorzonereae* Dum. Analyse fam. pl. (1829) 30, p. p.—Trib. Taraxaceae

D. Don in Edinb. New Philos. Journ. VI (1829) 307, p. p.—Trib. Hypochoerideae D. Don, Ibid,—Subtrib. Lampsaneae Less. op. cit. 126, p. min. p.—Subtrib. Hyoserideae Less. op. cit. 127, p. min. p.—Subtrib. Scorzonereae Less. op. cit. 131, p. p.—Sippen Hypochoerideae and Urospermeae Sch. Bip. in Flora XVII, 2 (1834) 475 and Picrideae and Leontodontae Sch. Bip. op. cit. 476.—Subtrib. Rhagadioleae Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 220, p. p. (solum gen. *Rhagadiolus* s. l.).—Subtrib. Crepideae Benth. op. cit. p. min. p.—Subtrib. Scorzonereae Benth. Ibid. 169, 221, p. min. p.—Subtrib. Leontodontinae O. Hoffm. in Engl. and Prantl, Nat. Pflanzenfam. IV, 5 (1893) 36, p. p.; Stebbins in Madroño XII, 3 (1953) 75.—Subtrib. Cichorinae O. Hoffm. op. cit. 353, p. min. p.—Pappus hairs of inner row plumose, outer setose, more or less toothed, or pappus entirely of plumose bristles; sometimes pappus of achenes in same capitulum different, coronate in some, of lanceolate-subulate scarious bristles in others; less often pappus entirely absent. Receptacle with membranous scales or smooth. Pollen grains spinose-cristate (echinolophate). Basic chromosome number $x = 7, 6, 5, 4$, and 3. Plants usually with stiff scattered pubescence, hairs often forked.

Type of subtribe: genus *Hypochaeris* L.

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GENUS 1639. *Hypochaeris* L.^{1,2}

L. Sp. pl. (1753) 810.

Capitula oblong-ovoid or almost campanulate, many-flowered, with involucre of imbricate bracts. Receptacle flat, with scarious, linear, long-acuminate scales. All florets ligulate, yellow. Achenes with or almost without beak, or only peripheral achenes without beak and inner ones beaked, smooth or scabrous; pappus two-rowed; bristles of outer row short, almost filiform, of inner row longer, plumose. Annual or biennial, less often perennial herbs with glabrous or hairy, simple or branched stem, or stemless. Leaves entire, toothed or pinnatilobate.

Type of genus: *Hypochaeris glabra* L.

About 15 species, predominantly Mediterranean.

1. Involucral bracts glabrous, outer bracts oblong-oval, inner ones lanceolate-linear, thin, subobtusely; peripheral achenes without beak or with short beak 1. **H. glabra** L.
- + Outer involucral bracts with narrow membranous border, ciliolate, lanceolate, obtuse; beak two to four times as long as achenes 2. **H. radicata** L.

¹ Treatment by V.N. Vassilev.

² From the Greek words: *ypo*—for, and *choiros*—pigs; pigs relish the roots of this plant.

Section 1. Hypochaeris.—Sect. *Euhypochaeris* Duby, Bot. gall. I (1828) 306.—Outer achenes more or less without beak, inner ones with beak.

Type of section: of genus species.

1. **H. glabra** L. Sp. pl. (1753) 811; DC. Prodr. VII, 90; Ldb. Fl. Ross. II, 775; Boiss. Fl. or. III, 783; Sch. Bip. in Nova Acta Acad. Caes. Leopold. Carol. Nat. Cur. XXI, 1 (1845) 144.

Annual. Root straight, digitate, simple or branched. Stems 15–30 cm high, 1–12 or more; outer ones ascending; middle ones erect, slender, cylindrical, sulcate, glabrous, branched, less often simple, with one capitulum, often in middle stems of rosula. Basal leaves 3–10 cm long, 0.5–1.5 cm wide, often numerous, lanceolate, oblong, emarginate and runcinately pinnatifid, acute, glabrous, or pubescent above and along margin. Capitula always erect, small, 1.5–2 cm long, 1.5–2 cm wide. Involucre almost cylindrical, imbricate, glabrous, slightly shorter than achenes with pappus, Outer involucre bracts oblong-ovate; inner ones lanceolate-linear, thin, subobtusate, somewhat dark above. Receptacle squamose; scales slightly shorter than pappus, long-acuminate, one-veined; inner florets golden-or lemon-yellow, with filiform tube longer than five-toothed ligule; peripheral achenes without beak or with a short beak, inner achenes long-beaked; all achenes with 15 well-developed, dark brown furrows, as also beak, scabrous; pappus dirty white, of two rows of bristles; outer bristles short, scabrous, scarcely plumose; inner bristles ten, longer, plumose. Flowering June to July; fruiting July to August.

Sands, as a weed in fields and pastures.—*European Part:* Baltic Region, Upper Dnieper, Middle Dnieper, Upper Dniester. *General distribution:* Scandinavia, central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, North America (western states, introduced), Australia (introduced). Described from western Europe. Type in London.

Section 2. Porcellites (Cass.) DC. Prodr. VII (1838) 91.—*Porcellites* Cass. in Dict. sc. nat. XXV (1822) 64 and XLIII (1826) 42, p. p. pro gen. Achenes with beaks of equal length.

Type of section: *Hypochaeris radicata* L.

2. **H. radicata** L. Sp. pl. (1753) 811; DC. Prodr. VII, 91; Ldb. Fl. Ross. II, 776; Boiss. Fl. or. III, 783; Sch. Bip. in Nova Acta Acad. Caes. Leopold.-Carol. Nat. Cur. I (1845) 155.—*Achyrophorus radicans* (L.) Scop. Fl. carniol. ed. 2, II (1772) 117. —*Porcellites radicata* (L.) Cass. in Dict. sc. nat. XLIII (1826) 43.—*Hypochaeris runcinata* Gilib. Fl. Lithuan. III (1785) 226.—*lc.*: Gaertn. De fruct. II (1791) t. 159.

Perennial. Root virgate, fusiform. Stem erect, 25–60 cm high, glabrous, usually branched, with very small sessile leaves, usually with few capitula at apices of branches. Leaves of basal rosette oblong-lanceolate, toothed, lyrate or runcinately pinnatifid, glabrous or hispid on both sides. Capitula large, 2.5–3.0 cm long, up to 2 cm wide at flowering and fruiting. Involucre imbricate, almost half as long as florets; outer involucre bracts lanceolate, obtuse, with narrow membranous border and ciliolate; inner bracts narrowly lanceolate, with long cusp; all involucre bracts absolutely glabrous or with long stiff cilia-like hairs along margin, or also with long ferruginous hairs on dorsal side. Corolla yellow with ligule almost two times as long as tube, with five linear oblong small teeth at apex. Achenes with beak, beak two to four times as long as achene, sulcate, transversely striate, prickly above and along beak; bristles of outer row of pappus short, simple, those of inner row two
201 times as long as outer, plumose. Flowering, second half of June to July; fruiting July to August (Plate XII, Fig. 6).

Mountain and plains meadows, forest glades, pine forests.—*European Part*: Ladoga-Ilmen, Upper Volga, Baltic Region, Upper Dnieper, Middle Dnieper, Upper Dniester, Bessarabia, Black Sea Region, Lower Don; *Caucasus*: Ciscaucasia, Dagestan, Eastern and Western Transcaucasia. *General distribution*: Scandinavia, central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, North America, Australia (introduced). Described from western Europe. Type in London.

GENUS 1640. *Achyrophorus* Scop.^{1,2}

Scop. Fl. carinol. ed. 2, II (1772) 116.

Capitula one to three, large, ovoid, often hemispherical or campanulate, with involucre of imbricate bracts. Receptacle flat, with long, membranous, conduplicate, linear, acuminate scales enclosing florets at base. All florets ligulate, yellow. Achenes with or without beak, terete-sulcate, oblong; pappus one-rowed, of plumose bristles. Perennial herbs with simple or weakly branched, more or less leafy stem, and rosette of large basal leaves.

Type of genus: *Achyrophorus maculatus* (L.) Scop.

About 20 species distributed in Europe, Asia, and mainly in South America.

1. Outer involucre bracts linear-lanceolate, dorsally hispid; stem branched, with few capitula 1. **A. maculatus** (L.) Scop.

¹ Treatment by V.N. Vassilev.

² From the Greek words: *achyron*—straw, and *pharion*—to bear.

- + Outer involucral bracts ovate or oblong-ovate, ciliate along margin, dorsally with crisped hairs; stem simple, one-headed 2.
- 2. Cauline leaves amplexicaul, capitula up to 2.5 cm long and wide; outer involucral bracts ciliate along margin.
..... 2. **A. ciliatus** (Thunb.) Scp. Bip.
- + Cauline leaves narrowed toward base; capitula up to 6 cm wide and 1 cm long, tomentose with upper part of stem; outer involucral bracts ciliate along margin, dorsally with long crisped hairs.
..... 3. **A. uniflorus** (Vill.) Bluff. and Fingerh.

Section 1. Achyrophorus.—Sect. *Phanoderis* DC. Prodr. VII (1838) 92.—All achenes distinctly narrowed into long beak; beak of outer achenes shorter than that of inner achenes.

Type of section: *Achyrophorus maculatus* (L.) Scop.

- 202 1. **A. maculatus** (L.) Scop. Fl. Carinol. II (1772) 116; DC. Prodr. VII. 92.—Ldb. Fl. Ross. II, 776; Kryl. Fl. Zap. Sib. XI, 2993.—*Hypochaeris maculata* L. Sp. pl. (1753) 810; Pall. Reise III, 687; Ldb. Fl. Alt. IV, 164; Kryl. Fl. Alt. III, 737.: Ic.: Garcke, Ill. Fl. Deutschl. (1895) 354.

Perennial. Root vertical, up to 1.5 cm thick near root collar. Stem erect, 30–120 cm high, densely (especially below) covered with stiff spreading hairs, less often almost glabrous, with one, less often two or three small, narrow leaves, simple or branched, covered with dark brown scales at base. Basal leaves oblong-elliptical, usually obtuse, narrowed toward base, sinuate-toothed, less often almost entire, often with reddish-brown spots, with scattered white, stiff, appressed hairs on both sides, less often one or other side glabrous, 5–25 cm long, 1.5–7 cm wide; cauline leaves sessile, oblong or lanceolate, acuminate. Capitula solitary at apices of main stem or lateral branches with oblong involucre, 15–30 mm wide, 15–20 mm long; outer bracts linear-lanceolate, dorsally hispid, inner; ones linear-oblong, glabrous or dorsally floccose, more or less membranous; all bracts yellowish-tomentose along margin. Ligules yellow, outer ones one and one-half times or more as long as involucre; scale acuminate, pubescent on outer side and along margin, slightly shorter than corolla or achene with pappus. Achenes yellowish-brown, with five longitudinal ribs, transversely rugose, with long beak, almost as long as achene; pappus one-rowed, of plumose hairs. Flowering June to July; fruiting June to August. (Plate XII, Fig. 4.)

Forest and steppe, plains and mountain meadows, forest edges, open birch and pine forests.—*European Part*: Dvina-Pechora, Ladoga-Ilmen, Upper Volga, Baltic Region, Volga-Kama, Upper Dnieper, Upper Dniester, Middle Dnieper, Volga-Don, Trans-Volga Region, Bessarabia, Black Sea

Region, Lower Don, Lower Volga Region; *Caucasus*: Ciscaucasia, Western Transcaucasia; *Western Siberia*: Ob', Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-Sayans, Dauria (west). *General distribution*: Scandinavia (southern part), central and Atlantic Europe, Mediterranean Region (northern Italy), Balkans-Asia Minor (Balkans). Described from western Europe. Type in London.

Section 2. Oreophila (D. Don) DC. Prodr. VII (1838) 93.—*Oreophila* D. Don. in Trans. Linn. Soc. XVI (1830) 178, pro gen.—All achenes with short beak, without beak, or with long beak; outer involucre bracts ovate or oblong-ovate, ciliate along margin.

Type of section: *Achyrophorus sessiliflorus* (Kunth) V. Vassil. comb. n

2. **A. ciliatus** (Thunb.) Sch. Bip. in Nova Acta Acad. Caes. Leopold. Carol. Nat. Cur. XXI, I (1845) 128; Kryl. Fl. Zap. Sib. XI, 2994.—*Arnica ciliata* Thunb. Fl. Jap. (1784) 318.—*Hypochaeris grandiflora* Ldb. Fl. Alt. IV (1833) 164; Kryl. Fl. Alt. III, 738; Kom. Fl. Manchzh. III, 764.—*Achyrophorus aurantiacus* DC. Prodr. VII (1838) 93.—*A. grandiflorus* (Ldb.) Ldb. Fl. Ross. II (1844–1846) 777; Maxim. Prim. Fl. amur. 176.—*Hypochaeris ciliata* (Thunb.) Makino in Bot. Mag. Tokyo XXII (1908) 37.—*H. aurantiaca* Turcz. ex DC. Prodr. VII (1838) 94 in syn.—*Amblachaenium aurantiacum* Turcz. ex DC. op. cit. 94 in syn.—*Oreophila sibirica* C.A. Mey. ex Turcz. in Bull. Soc. Nat. Mosc. XI (1838) 95.—**IC.**: Ldb. Ic. pl. fl. ross., t. 440.

Perennial. Root straight, stiff. Stem straight, 30–65 cm high, simple, with dry brown scales at base, finely sulcate, rather densely hispid throughout or only below, less often almost entire stem glabrous. Basal leaves in rosettes, petiolate, oblong, slightly expanded in upper part, acute, sharp-toothed, setose-ciliate; lower cauline leaves like basal; middle and upper leaves sessile, amplexicaul, reduced toward apex, oblong or elliptical, finely toothed, hispid beneath. Capitula large, with almost hemispherical involucre, about 2.5 cm long and wide. Outer bracts ovate or oblong-ovate, ciliate along margin; inner bracts lanceolate, acute. Ligules bright orange, with narrow tube, slightly longer than limb; limb margin with five cristate denticles. Achenes terete, slightly narrowed upward; pappus one-rowed, of plumose hairs. Flowering June to July; fruiting end of July to beginning of August.

Bottomland and mountain meadows, less often in thickets of shrubs, in drier habitats, especially sandy soils.—*Western Siberia*: Altai; *Eastern Siberia*: Lena-Kolyma, Dauria; *Far East*: Zeya-Bureya, Ussuri. *General distribution*: Mongolia, northeastern China, northern part of Korean Peninsula; in Japan, only under cultivation as an ornamental plant. Described from Japan. Type in Uppsala.

Economic Importance. Can be recommended as an ornamental plant.

3. **A. uniflorus** (Vill.) Bluff. and Fingerh. Compend. Fl. Germ. II (1825) 307.—*Hypochaeris uniflora* Vill. Prosp. pl. Dauph. (1779) 37.—*H. foliosa* Vill. Fl. Dauph. III (1785) 25.—*H. helvetica* Wulf. in Jacq. Miscell. Austr. III (1785) 25.—*Achyrophorus helveticus* (Wulf.) Hornem. Hort. hafn. II (1815) 772; Less. Synops. compos. (1832) 130.—*Porcellites helvetica* (Wulf.) Cass. in Dict. sc. nat. XLVIII (1826) 43.—**lc.**: Jacq'. Ic. pl. rar. (1781) t. 165; Vill. op. cit. (1789) 61, t. 23.

204 Perennial. Root cylindrical, fusiform. Stem solitary (very rarely two), erect, 10–40 cm high, strong, ribbed-sulcate, thickened above, covered with simple short fibers. Basal leaves oblong-lanceolate, 8–20 cm long, up to 2 cm wide, sinuate-toothed, acute, hispid, on short, less often on long petioles; cauline leaves two or three, sessile, smaller than basal, often very small, narrow leaves present in upper part of stem, resembling outer involucre bracts. Capitulum one, at stem apex, up to 6 cm wide and 4 cm long at flowering. Involucre imbricate, tomentose below, like upper part of stem; outer and middle involucre bracts ovate or oblong-ovate, ciliate along margin, with simple crisped, somewhat long, light gray hairs on dorsal side; inner bracts narrowly lanceolate. Receptacles squamose; scales linear, one-veined, long-acuminate, as long as achene with pappus. Ligules golden, peripheral twice as long as involucre and twice as long as tube. Achenes yellowish; peripheral ones harder and shorter, inner ones thinner and longer; usually 3 cm long including pappus, 2 cm without pappus, with longitudinal furrows; pappus persistent, of 22–25 plumose whitish bristles, one-rowed. Flowering June to July; fruiting July to August.

Alpine zone.—*European Part*: Upper Dniester (Carpathians). *General distribution*: central and western Europe. Described from western Europe. Type in Paris.

Economic Importance. Suitable for cultivation as an ornamental plant.

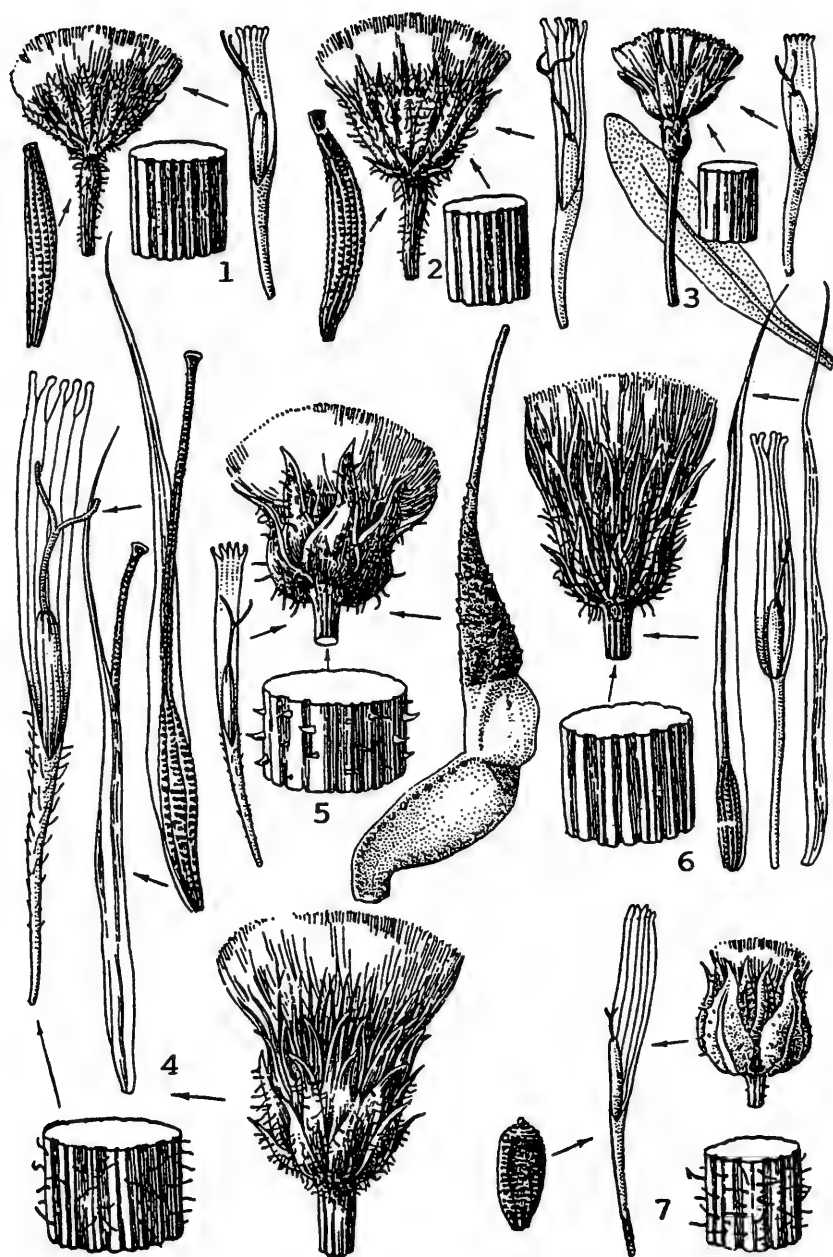
GENUS 1641. *Leontodon*^{1, 2}

L. Sp. pl. (1753) 798.

Capitula many-flowered; involucre more or less imbricate, one- to three-rowed, outer bracts shorter. Receptacle without scales, alveolate, fibrous or finely punctate, with small scaly hairs along edge of pits. All

¹ Treatment by V.N. Vassilev.

² Name derived by combining two latin words: *leo*—lion, and *dens*—tooth; named on the basis of the leaf shape resembling lion teeth.



- 1—*Leontodon croceus* Haenke.; 2—*L. gutzlorum* V. Vassil.; 3—*L. rilaënsis* Hayek.;
 4—*Achyrophorus maculatus* (L.) Scop.; 5—*Urospermum picroides* (L.) Desf.;
 6—*Hypochaeris radicata* L.; 7—*Helminthia echioides* (L.) Gaertn.

florets ligulate, yellow or orange. Achenes terete, more or less fusiform, without or with short beak, longitudinally sulcate, transversely rugose; pappus persistent, one- or two-rowed, its bristles not connate at base, bristles of inner row plumose, of outer row always shorter, often with simple teeth. Stem simple, one-headed, or branched and with few capitula. Leaves in basal rosette, toothed or pinnatifid, less often subentire. Annual or perennial herbs.

Type of genus: *Leontodon hispidus* L.

206 As many as 45 species have been recognised in the genus, many of which are distributed in the Mediterranean Region. To the east, the genus reaches up to the western part of western Siberia; in the north it reaches the tundra zone. A few species are present in North and South America.

1. Plant covered with simple hairs or absolutely glabrous 2.
- + Plant covered with forked or stiff stellate hairs or simple hairs mixed with forked hairs 10.
2. Plants absolutely glabrous 6. **L. danubialis** Jacq.
- + Plants never absolutely glabrous 3.
3. Rhizome creeping, horizontal; leaves and stem covered with sparse and scattered long silky hairs 7. **L. repens** Schur.
- + Rhizomes short, as if truncate 4.
4. Scape with one capitulum, less often with two 5.
- + Scape always with two or more capitula 8.
5. Leaves entire, glabrous, smooth; scape up to 10 cm high, as also involucre bracts, sparsely pubescent 3. **L. rilaënsis** Hayek.
- + Leaves toothed or more or less divided 6.
6. Plant short, 5–15(18) cm high, scape with one, less often with two capitula 2. **L. pseudotaraxaci** Schur.
- + Plant taller, 15–35 cm high, always one-headed 7.
7. Florets orange; achenes without beak; pappus one-rowed 9. **L. croceus** Haenke.
- + Florets yellow; achenes with short beak; pappus two-rowed 8. **L. schischkinii** V. Vassil.
8. Capitula densely covered with long stiff rusty-greenish hairs; pappus two-rowed 4. **L. keretinus** Nyl.
- + Pubescence of capitula different; pappus one-rowed 9.
9. Involucre with white arachnoid pubescence (f. *autumnalis*) or, in addition, with long, setose, rusty, less often almost white or black hairs (f. *pratense*); achenes fusiform 1. **L. autumnalis** L.
- + Involucre densely covered with long, dark, soft hairs; achenes terete, beaked 5. **L. gutzlorum** V. Vassil.
10. Root long, radish-shaped, merging with rhizome above; scape simple or with one or two branches; outer involucre bracts ciliate;

- 207 + bristles white, short, forked; achenes with long beak 11.
- + Rhizome short, as if truncate; scape always one capitulum; outer involucre bracts without forked bristles; achenes with short beak 13.
11. Pubescence on leaves and stem of gray, very short, forked and stellate hairs, hence whole plant grayish, as if velutinous 12 **L. kotschyi** Boiss.
- + Pubescence on leaves and stem of long gray forked hairs, hence plant setose-hairy 12.
12. Capitula 2–2.5(3) cm long, narrowly obconical before flowering, almost cylindrical; achenes 15–20 mm long 11. **L. asperimus** (Willd.) Boiss.
- + Capitula shorter, up to 1.5 cm long, obconical before flowering; achenes 8–12 mm long 10. **L. asperus** (Waldst. and Kit.) Boiss.
13. Stem glabrous; leaves and involucre bracts glabrous or sparsely hairy; hairs on leaves simple and forked 14. **L. caucasicus** (M.B.) Fisch.
- + Stem scabrous from short forked hairs; leaves rather densely covered with short or long, forked hairs; involucre densely covered with simple setose hairs 13. **L. hispidus** L.

Subgenus 1. **Scorzoneroides** (Moench) V. Vassil. comb. nova.—*Scorzoneroides* Moench, Meth. pl. (1794) 549, pro gen.—*Apargia* Scop. Fl. Carniol. ed. 2, II (1772) 113, p. p.—Subgen. *Euleontodon* Widder in Oesterr. Bot. Zeitschr. (1931) 146.—Plants with simple hairs or glabrous; rhizome reduced, very rarely (in *L. repens*) creeping; scapes simple or more or less branched, thickened below capitula.

Type of subgenus: *Leontodon autumnalis* L.

Series 1. **Autumnales** V. Vassil.—Leaves and stem glabrous or weakly pubescent; stem ascending; achenes not beaked; pappus one-rowed.

Leontodon montanus Lam. and *L. pyrenaicus*. Gouan, from outside of the limits of our flora, also belong to this series.

1. **L. autumnalis** L. Sp. pl. (1753) 798; Ldb. Fl. Ross. II, 778; Boiss. Fl. or. III, 729.—*Scorzoneroides*, *Autumnalis* (L.) Moench, Meth. pl. (1794) 549.—*Hedypnois autumnalis* (L.) Huds. Fl. Angl. ed. 2 (1762) 341.—*Picris autumnalis* (L.) All. Fl. Pedem. 1 (1785) 210.—*Apargia autumnalis* (L.) Hoffm., Deutschl. Fl. ed. II (1804) 113.—**lc.**: Fedtsch. and Fler. Fl. Evrop. Rossii, Fig. 1062.

Perennial. Rhizomes reduced, as if truncate, with numerous stiff hairs. Stems usually branched, less often simple. Plants glabrous or more or

less densely covered with simple hairs (f. *pratense* Koch). Basal leaves 208 prostrate, elongated, rather wide, with long-winged petioles, toothed, pinnatifid or pinnatipartite with linear lobes, less often entire or almost entire (f. *subintegrifolius* m.). Peduncles long, fistular, thickened at apex, with linear or subulate, appressed leaflets. Capitula erect before flowering, up to 2 cm long at flowering, 2.5 cm wide at fruiting. Involucre of lanceolate bracts with white arachnoid pubescence (f. *autumnalis* m.) or, also with long setose ferruginous, rarely almost white or black, hairs (f. *pratensis* Koch). Corolla yellow, very rarely pale violet. Achenes fusiform, 5 mm long, slightly narrowed at both ends, sulcate, transversely rugose; pappus up to 6–7 mm long, dirty white, one-rowed, of plumose, barbed bristles, weakly thickened toward base; less often simple barbed bristles found among plumose ones. Flowering July to October; fruiting August to October.

Fields, pastures, meadows, shrubby thickets, open forests.—*Arctic Region*: Arctic Europe (Kola Peninsula); *European Part*: Karelia-Lapland, Dvina-Pechora, Ladoga-Ilmen, Upper Volga, Volga-Kama, Upper Dnieper, Middle Dnieper. Volga-Don, Trans-Volga Region, Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga; *Caucasus*: Ciscaucasia, Western and Southern Transcaucasia; *Western Siberia*: Ob', Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-Sayans (village of Mysovka, introduced); *Far East*: Kamchatka (introduced), Ussuri (introduced), Sakhalin (introduced). *General distribution*: Scandinavia, central Europe, Atlantic Europe. Described from northern Europe. Type in London.

Note. This species is extremely polymorphic, but there is little justification for elevating its forms to the rank of species.

2. ***L. pseudotaraxaci*** Schur. Enum. pl. Transsilv. (1866) 357.—*L. taraxaci* var. *tatricus* Kot. Distr. pl. in mont. Tat. (1890) 356.—*L. clavatus* Sag. and G. Schm. Fl. Carp. centr. II (1891) 254.—*L. tatricus* (Kot.) Wolocz. Fl. Polon. exs. (1897) 545.—**Ic.**: Javorka and Csapody, Icon. Fl. Hung. (1933) 554, No. 3984.

Perennial. Rhizomes decurrent, many-headed; scape ascending, with one, less often two capitula, 8–15 cm long, distinctly thickened in upper part, sulcate, densely covered with simple, thick, soft hairs and scaly leaves above merging with involucre bracts, glabrous or almost glabrous below. Basal leaves oblong-spatulate, obtuse, narrowed into long petiole, runcinately pinnatifid, with 3–15 cm long petiole, sometimes with three unequal, almost triangular, sharp teeth in middle on both sides, glabrous or with less numerous, long, simple hairs beneath. Capitula turbinate, drooping before flowering; involucre bracts linear, dorsally covered with blackish hairs, their tips and margin white-sericeous. Corolla orange, tube 209 scatteredly white-sericeous; ligules truncate above, five-toothed. Pappus

dirty white, weakly ferruginous on drying; pappus bristles plumose, one-rowed, strongly thickened at base; achenes flat, somewhat curved, sulcate, smooth, matty. Flowering August; fruiting August to September. (Plate XIII, Fig. 1.)

Limestone rocks of alpine zone, swales.—*European Part*: Upper Dniester. *General distribution*: Central Europe (Transylvanian Alps). Described from Kronstadt-Alps. Type in Lvov.

3. *L. rilaënsis* Hayek in Denkschr. Akad. Wissensch. 94 (1918) 198. Widder in Oesterr. Bot. Zeitschr. LXXVI (1927) 293.—*L. pyrenaicus*, d. *integerrimus*, Schur. Enum. Pl. Transsilv. (1866) 358.—*lc.*: Javorka and Csapody, Icon Fl. Hung. (1933) 554, No. 3983a.

Perennial. Rhizome more or less obliquely truncate; scape usually solitary, erect, 10–15 cm high slender, two times as long as rosulate leaves, leafless below, glabrous, thickened above, leafless or with linear-lanceolate scaly leaves, especially below capitula in thickened part, and covered with white-arachnoid pubescence. Leaves 3–6 cm long, spatulate-linear or lanceolate, narrowed toward base, with winged petioles, entire or, very rarely, with one to three indistinct teeth, glabrous. Capitula always erect. Involucral bracts linear-lanceolate, loosely imbricate; outer bracts with blackish or light green hairs on dorsal surface (f. *viridulus* m.), white-arachnoid along margin, inner bracts glabrous, translucent; receptacle glabrous; ligules yellow. Achenes terete-fusiform, sulcate, sometimes also weakly transversely rugose; pappus plumose, very rarely at apex with small simple bristles, lustrous, dirty white. Flowering July. (Plate XII, Fig. 3).

Pastures in subalpine zone.—*European Part*: Upper Dniester. *General distribution*: central Europe (Carpathians), Balkans-Asia Minor (Balkan Peninsula). Described from the Balkan Mountains. Type in Vienna.

Note. Our material differs from the type specimen by the absence of blackish hairs on the upper, expanded part of the scape and by having light green hairs on the dorsal surface of the outer involucral bracts. Apparently, *L. pyrenaicus* Gouan is the closest species to *L. rilaënsis*.

Series 2. Keretini V. Vassil.—Stem branched, ascending; capitula rather densely covered with long, relatively soft hairs; achenes short-beaked; pappus one-rowed or two-rowed.

4. *L. keretinus* Nyl. Spicil. pl. fenn. I (1843) 24; Ldb Fl. Ross. II, 779.

Perennial. Rhizome as if truncate, with numerous fibrous roots, many-headed, producing few slightly arcuate stems. Stems sulcate, glabrous up to branching, weakly pubescent and branched above, 15–45 cm high, with several capitula. Basal leaves glabrous or with sparse simple hairs, smooth, oblong-lanceolate, lamina decurrent on petiole, 3–18 cm long,

deeply pinnatifid, with narrowly lanceolate or linear lobes, usually antrorse; usually leaves simple, linear, sometimes few large pinnatifid leaves near fork. Peduncles distinctly thickened, with small linear leaves, gradually merging with involucre bracts. Capitula turbinate; involucre bracts linear, acute, densely covered with simple, long, somewhat stiff, ferruginous hairs, with soft, short, silky, dirty white hairs above; ligules orange. Achenes 5–7 mm long, brown, sulcate, transversely rugose, with short beak; pappus 5–7 mm long, dirty white, plumose, two-rowed; pappus bristles almost not thickened at base, outer bristles short. Flowering June to July; fruiting July to August.

River valleys, crop fields, pastures.—*European Part*: Karelia-Lapland, Dvina-Pechora, Ladoga-Ilmen, Upper Volga, Volga-Kama. *General distribution*: Scandinavia (Finland). Described from Keret River. Type in Leningrad.

Note. The small number of specimens was collected from the northern and northwestern part of Eastern Europe. In general appearance, it is sharply distinguished not only from typical, *L. autumnalis* L., but also from its var. *pratensis* Koch, from which it differs by the brighter color of its corolla and the nature of the pubescence on the capitula and receptacle.

5. *L. gutzlorum* V. Vassil. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 397.

Perennial. Rhizome short, as if truncate, with numerous fibrous roots, many-headed. Stems 18–25 cm high, arcuately ascending, branched, with two to four capitula, glabrous, smooth, distinctly thickened above and covered with dark soft hairs, with small subulate acuminate leaves near fork and above. Basal leaves glabrous, smooth, sinuate-long-toothed or pinnatifid, with antrorse lobes, somewhat acuminate, less often leaves almost entire, 7–10 cm long, 1–1.5(2) cm wide. Capitula drooping before flowering, erect during and after flowering, turbinate, 2 cm long at flowering, 2 cm wide. Involucre bracts dark green, densely covered with dark, soft, long hairs, with dirty-white short silky hairs at apex and along margin; corolla yellow, much longer than involucre. Achenes yellowish, terete, sulcate, narrowed into beak, transversely rugose, 7 mm long, 0.5 mm wide; pappus one-rowed, up to 7 mm long, somewhat sordid; its bristles plumose, somewhat thickened at base. Flowering July; fruiting August. (Plate XII, Fig. 2.)

Alpine patches of meadow.—*European Part*: Upper Dniester (Goverla Mountain). *General distribution*: central Europe. Described from Goverla Mountain. Type in Leningrad.

211 **Note.** Extremely close to *L. pseudotaraxaci* Schur, on the basis of the pubescence on the peduncles and involucre bracts, but it is well

differentiated by the branched stem, glabrous leaves and large size of the entire plant.

Series 3. *Danubiales* V. Vassil.—Scape always one-headed, glabrous or weakly pubescent; achenes without beak; pappus one-headed, except in *L. croceus* Haenke.

6. ***L. danubialis*** Jacq. Enum. Stirp. vindobon. (1762) 139, 270.—*L. hastilis* L. Sp. pl. ed. 2 (1763) 1123; Ldb. Fl. Ross. II, 780.—*Apargia dubia* Willd. Sp. pl. ed. IV, III, 3 (1803) 1549.—*Leontodon hyposeroides* var. *glaberrimus* Schur, Enum. pl. Transsilv. (1866) 359.—*L. clavatus* Schur, Phyt. Mitt. (1876) 193.—*Picris danubialis* (Jacq.) All. Fl. Pedem. I (1785) 211.—**Ic.:** All. Ibid. t. 70, fig. 3; Jacq. Fl. Austr. II (1774) t. 164; Javorka and Csapody, Ic. Fl. Hung. (1929) 555, No. 3981.

Perennial. Rhizome truncate, short, with numerous fibrous roots; scapes 15–40 cm high, glabrous, smooth, one or two from single rhizome, each one-headed, sometimes reddish at base, entirely leafless or with one or two linear scaly leaves above, very rarely with one or two scaly leaves in lower part of scape, usually not thickened below capitulum. Leaves of rosette spatulate, toothed, sinuate-toothed or emarginate-toothed, less often almost entire, thin, glabrous, on rather long winged petioles, 3–22 cm long (including petioles), 0.9–3.0 cm wide. Capitulum erect; involucre bracts dark green, imbricate, linear, subulate, glabrous, ciliate only along margin, cilia white, short; outer bracts deflexed; ligules yellow, with long white hairs at base. Achenes 6 mm long, brownish, slightly curved, longitudinally sulcate, transversely rugose, without beak; pappus 8 mm long, two-rowed, setose, bristles of outer row thin, short, simple, barbed, inner bristles plumose, strongly thickened toward base. Flowering July.

Meadows, borders of fields, roadsides, glades in beech forest zone.—**European Part:** Ladoga-IImen, Upper Dnieper, Middle Dnieper, Upper Dniester, Black Sea Region, Crimea; **Caucasus:** Ciscaucasia, Dagestan, Eastern, Western, and Southern Transcaucasia, Talysh. **General distribution:** central Europe, Atlantic Europe, Balkans-Asia minor (north of Balkan Peninsula). Described from vicinity of Vienna. Type in Vienna.

Note. In the almost complete absence of pubescence and shape of the leaves, this species is closest to *L. montaniformis* Widd. and *L. pseudotaraxaci* Schur.

7. ***L. repens*** Schur in Verh. Siebenb. Ver. X (1859) 138, 148, 173; Degen in Mag. Bot. Lapok 23 (1924) 91–94.—*L. hispidus* b. *caucasicus* Grecesku, Consp. Fl. Roman. (1898) 353; Unger. Fl. Siebenbürg. (1925) 498.—*L. kulczinskii* M. Pop. Ocherk Rast. i Fl. Karpat (1949) 299.—212 **Ic.:** M. Pop. op. cit. 255; Javorka and Csapody, Ic. Fl. Hung. I (1929) 554, No. 3980a.

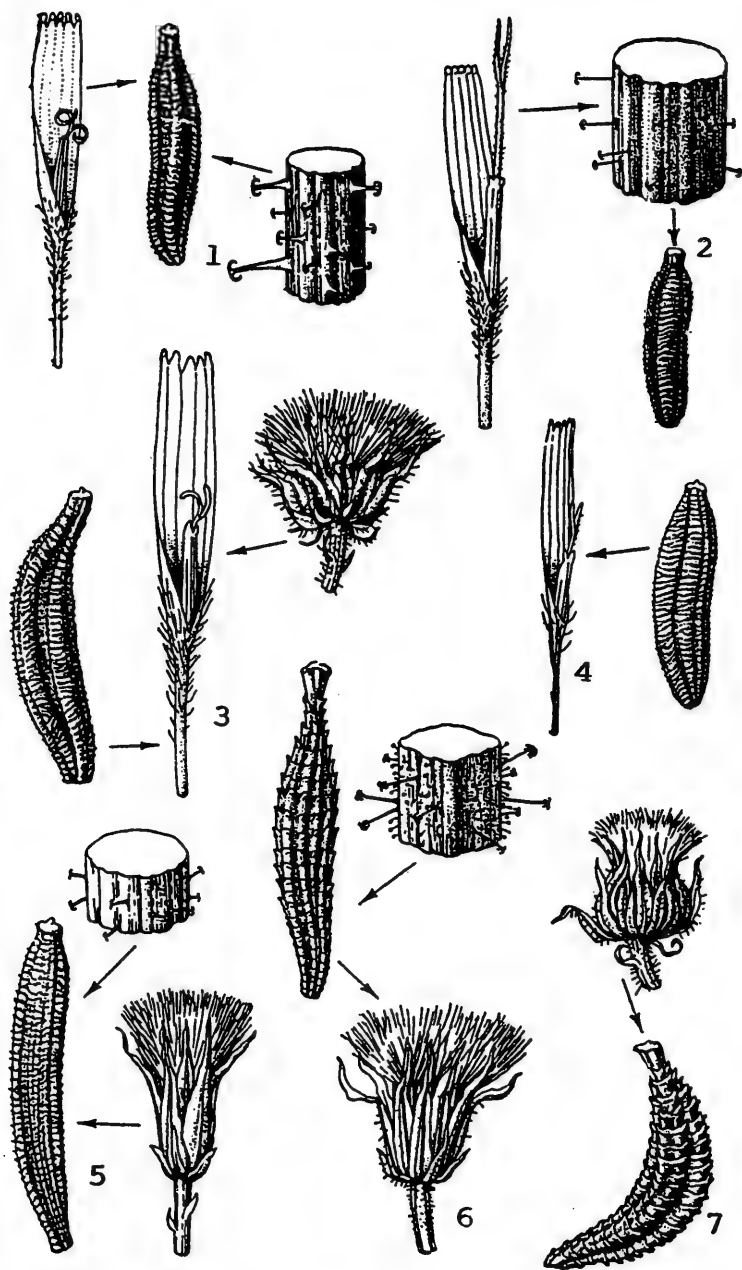
Perennial. Rhizome horizontal, rather long, creeping or obliquely ascending, branched, developing rosette; scapes (stem) one-headed, 25–45 cm, high, less often shorter, with rosette of basal leaves, leafless above or with a small leaf below capitulum, sulcate, covered with simple scattered hairs, thickened above below capitulum, densely hairy; leaves narrow, oblong-lanceolate, narrowed toward base, 9–23 cm long, 1–3 cm wide, finely toothed or almost entire, dark green, with dense simple hairs on both sides along margin and on lower side along midrib. Capitula blackish, with involucre of appressed bracts, outermost bracts loose, slightly deflexed, narrowly lanceolate, distinctly narrowed above, weakly translucent along margin, smooth, with long whitish hairs along dorsal surface, obtuse-ciliate above; ligulate florets yellow, often brownish on outer side, two times as long as involucre bracts, toothed above, with blackish teeth. Pappus 9 mm long, dirty white, of unequal bristles, inner bristles plumose, outer ones short, scabrous; achenes chestnut-colored, 5 mm long, without beak. Flowering July, August; fruiting August to September. (Plate XIII, Fig. 5.)

Meadows of subalpine and alpine zones. *European Part*: Upper Dniester. *General distribution*: Central Europe (Transylvanian Alps). Described from Transylvania. Type in Vienna.

8. *L. schischkinii* V. Vassil. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXI (1961) 398.

Perennial. Rhizome truncate, with numerous stiff hairs, one-, two- or three-headed; stem scape, 15–35 cm high, one-headed, weakly thickened above, smooth, only near apex and at base with very short, appressed, white, silky hairs and one or two linear-lanceolate or linear-subulate small leaves (or without them). Basal leaves 5–10 cm long, 1–2 cm wide, spatulate, glabrous or weakly pubescent with simple hairs, remotely sinuate-toothed or sinuate-incised, gradually narrowed into winged petiole. Capitula drooping before flowering, erect at flowering, 2.5 cm long, 3.5 cm wide (at flowering). Outer involucre bracts short, linear, deflexed; inner ones narrowly lanceolate, acuminate, white-sericeous along margin, 214 with similar fine hairs on dorsal side; outer most involucre bracts glabrous, with scarious margin; receptacle glabrous. Corolla yellow; ligules with five very short teeth, darker than remaining part of ligule, with long, crisped, white, silky hairs at base. Achenes brown, fusiform, sulcate, transversely rugose, somewhat curved, up to 0.5 cm long; pappus up to 0.8 cm long, dirty white, two-rowed, of plumose bristles; bristles of outer row much shorter and thinner than inner, inner bristles strongly thickened toward base. Flowering July; fruiting August. (Plate XIII, Fig. 3.)

Glades, forest edges, mountain slopes.—*European Part*: Upper



Dniester. *General distribution*: central Europe. Described from eastern Carpathians. Type in Leningrad.

Note. It differs from *L. pyrenaicus* Gouan, with which it was confused, by having larger and more deeply divided or boldly dentate leaves and involucre bracts with fine white arachnoid pubescence, whereas the pubescence of the involucre bracts in *L. pyrenaicus* consists of dark, sometimes almost black, long hairs.

9. *L. croceus* Haënke in Jacq. Collectanea II (1788) 16; Rchb. Fl. Germ. exc. (1830) 252.—*L. auranthiacus* (Waldst. and Kit.) Rchb. ibid. 252, p. max. p. —*Apargia aurantica* Wald. and Kit. in Willd. Sp. pl. III, 3 (1803) 1547.—*A. crocea* (Haënke) Pollini, Fl. Veron. II (1820) 565.—**lc.**: Pollini Ibid. t. 2, fig. 8; Hegi, Ill. Fl. VI, 2 (1928) 1023, 1024; Javorka and Csapody, Icon. Fl. Hung. I (1929) 554, No. 3983.

Perennial. Rhizome somewhat truncate, somewhat thick, with numerous fibrous roots; Stem-scape 15–30 cm high, with one, less often two capitula, with one to three (five) small linear leaves above, sulcate, glabrous, smooth below, with dense, simple, somewhat dark, hairs above mixed with white arachnoid pubescence, thickened below capitulum. Basal leaves three to six, 10–24 cm long, 0.5–2 cm wide, with simple, light-colored scattered hairs above, along margin and beneath along midrib, linear-lanceolate, acute, with straight or uncinat teeth. Capitula erect before and at flowering, 2–2.5 cm long, up to 3 cm wide. Involucre bracts imbricate, outermost bracts short, narrowly linear, middle ones linear-lanceolate, innermost bracts broadly linear; outer and middle bracts on back side, especially along midrib, covered with long, simple, dirty white or blackish, hairs; inner bracts glabrous, sometimes white-arachnoid along margin, often outside; corolla saffron-golden, with five concolorous teeth at apex; receptacle glabrous, flat. Achenes without beak, fusiform, ribbed, glabrous, slightly convex on one side, brown, 5 mm long, about 1 mm wide, pappus as long as achene or slightly longer, dirty white, one-rowed, its bristles plumose above, thickened and barbed at base. Flowering second half of June to July; fruiting second half of July. (Plate XII, Fig. 1.)

Patches of meadow and rocky outcrops in alpine zone.—*European Part*: Crimea(?), Upper Dniester. *General distribution*: central Europe, Mediterranean Region (Italy). Described from styrian Alps. Type in Vienna.

Subgenus 2. Leontodon.—*Apargia* Scop. Fl. Carniol. ed. 2, II (1772) 113, p. p.—*Asterothrix* Cass Dict. sc. nat. XLVIII (1828) 434.—*Subgen. Apargia* (scop.) Widder in Oesterr. Bot. Zeitschr. (1931) 146. Hairs forked or stellate or mixture of simple and forked hairs.

Type of subgenus: type of genus.

Series 4. Asperi V. Vassil.—Root long, radish-shaped, only with forked and stellate hairs; achenes with long beak; involucre bracts with very short, white, somewhat thick, forked hairs along margin.

10. *L. asperus* (Waldst. and Kit.) Boiss. Fl. or. III (1875) 730; Poir, Encycl. meth. Suppl. 453; Rchb. Fl. Germ. exc. 252.—*Apargia aspera* Waldst. and Kit. Icon. pl. Hung. II (1805) 114.—*Leontodon crispus* Vill. Hist. pl. Dauph. 3 (1789) 84.—*L. biscutellaefolius* DC. Prodr. VII (1838) 103.— **Ic.:** Rchb. **Ic.:** Fl. Germ. XIX (1860) t. 1370, II, 7–11; Waldst. and Kit op. cit. t. 110; Vill. op. cit. t. 25; Javorka and Csapody, Ic. Fl. Hung. I (1929) 554, No. 3977.

Perennial. Root radish-shaped, merging with many-headed rhizome above. Stems 10–40 cm high, one-headed, less often with one or two branches and then with two or three capitula, scabrous from numerous short stiff setose, two- or three- (four)-forked hairs, with two to four small lanceolate-linear leaves, densely covered with erect forked hairs. Basal leaves narrowly lanceolate, narrowed toward base into winged petiole, sinuate-lobate, remotely toothed, hispid-scabrous on both sides from two to four-forked, very short hairs. Capitula usually turbinate before flowering, 1.5 cm long, up to 2 cm wide, up to 1.5 cm at fruiting, Involucre bracts, except innermost, covered with short, stiff, erect hairs along margin, with three- or four-forked hairs above, along keel, and with longer, setose. appressed hairs throughout on dorsal surface; inner bracts scarious along margin, entirely glabrous or with very fine appressed stellate hairs, as also middle involucre bracts. Receptacle covered with numerous white fimbriate scales; corolla light yellow. Achenes 8–12 mm long, flat on one side, weakly convex on the other, narrowed into a long
216 beak above, sulcate, transversely rugose, setose-scabrous along beak; pappus two-rowed, up to 1 cm long, dirty white; bristles of outer row less numerous, barbed, shorter than inner; inner bristles plumose, not thickened at base, as also outer row of bristles Flowering second half of May to first half of August; fruiting June to August. (Plate XIII, Fig. 6.)

Along dry stony and rocky slopes, meadows.— *European Part:* Volga-Kama (Kazan), Upper Dnieper, Middle Dnieper Volga-Don, Bessarabia, Black Sea Region, Crimea, Lower Don; *Caucasus:* ?Ciscaucasia, Western and Southern Transcaucasia, Talysh. *General distribution:* Central Europe, Mediterranean Region, Atlantic Europe, Balkans-Asia Minor, Armenia and Kurdistan. Described from Hungary. Type in Budapest.

Note. Intermediate forms between *L. asperrimus* and *L. asperus* are found in the Caucasus. Their origin can be established only by observing them in the field or after conducting crossing experiments with the hypothesized parent species.

11. **L. asperrimus** (Willd.) Boiss. Fl. or. III (1875) 732.—*Scorzonera asperrima* Willd. Sp. pl. III, 3 (1803) 1507.—*Apargia strigosa* M.B. Fl. taur.-cauc. II (1808) 249.—*Asterothrix asperrima* (Willd.) Cass. Dict. sc. nat. XLVIII (1827) 434.—*Podospermum asperrimum* (Willd.) Sweet, Hort. Bot. ed. I (1827) 206.

Perennial. Root radish-shaped, merging in many-headed rhizome above, bearing one to four (five) stems. Scapes 15–45 cm high, with a small number of small, linear or subulate, entire, acute leaves and with one fertile capitulum at apex. Sometimes one or two sparsely leafy twigs with apical capitulum, almost as long as stem, originate from lower half of main stem; stem base with dense rosette of oblong-lanceolate, entire or remotely sinuate-toothed leaves, 5–20 cm long, 0.5–2 cm wide; whole plant densely covered with long, stiff, straight, pale-green hairs, stellate above (with three or four upward-directed cusps). Capitula large, 2–2.5(3) cm long, 1.5 cm wide in middle and 2 cm wide above. Involucre cylindrical, bracts imbricate, linear or lanceolate; outer bracts along keel and margin covered with stiff hairs, stellate-forked above; inner bracts flat, with membranous margin, as also others, weakly white arachnoid on dorsal surface. Receptacle weakly convex, densely covered with fimbriate scales. Achenes long, 15–20 mm long, fusiform, sulcate, somewhat flattened, transversely rugose, attenuate at apex into scabrous beak as long as achene; pappus dirty-white, of long (up to 1.5 cm), plumose bristles in two rows, and not thickened near base. Flowering first half of May to June; fruiting first half of June to July. (Plate XIII, Fig. 4.)

Exposed stony and rocky mountain slopes, ravines.—*Caucasus*: Ciscaucasia, Eastern, Western and Southern Transcaucasia, Dagestan, Talysh; *Soviet Central Asia*: mountainous Turkmenia. *General distribution*: 217 Asia Minor, Armenia and Kurdistan, Iran. Described from Galata. Type in Berlin.

12. **L. kotschyi** Boiss. Diagn. pl. or. ser. I, 11 (1849) 40.—*Ik.*: Hegi, Ill. Fl. VI, 2, t. 1026, 1030, 1031; Javorka and Csapody, Iconogr. Fl. Hung. t. 554.

Perennial. Root long, radish-shaped, merging with one-, two- or three-headed rhizome above. Stems 7–30 cm high, simple, or, less often, with one or two branches and one to three capitula at apices of main stem and branches, with few linear or subulate-linear leaves, not thickened below capitulum, scabrous from very short, stellate, straight hairs. Basal leaves 7.5–10 cm long, 0.8–2 cm wide, narrowly lanceolate, with winged petiole, sinuately pinnatifid or remotely toothed, with acute lobes and teeth, rather densely covered with very short, stiff, erect three- or four-forked hairs on both sides and along margin. Capitula obconical, 1.3–2 cm long, 1.12–2 cm wide at flowering; involucre bracts imbricate, outer very short,

deflexed, lanceolate; inner bracts dense, appressed, linear-lanceolate, with very short stellate hairs along margin and midrib, remaining part finely arachnoid-hairy; inner involucre bracts scarious along margin, finely arachnoid-hairy on dorsal surface. Ligules yellow, unicolorous, with five long teeth; corolla tube and lower part of ligule sparsely sericeous. Receptacle convex, squamose, glabrous. Achenes up to 1 cm long, narrowed into beak above, sulcate, transversely undulate, sharply scabrous on beak, weakly flattened, brown; pappus dirty-white, as long as achene, two-rowed; bristles of outer row short, barbed, of inner row plumose, not thickened near base. Flowering June to July; fruiting July to August. (Plate XIII, Fig. 7.)

Dry slopes, stony screes.—*Caucasus*: Talysh. *General distribution*: Iran. Described from Mt. Demavend [Damāvand]. Type in Geneva.

Series 5. Hispidi V. Vassil. Rhizome short, truncate; pubescence either exclusively of forked hairs (*L. hispidum*) or mixed, including simple and forked hairs; achenes without beak or with very short beak; involucre bracts arachnoid-hairy along margin in upper half.

13. *L. hispidus* L. Sp. pl. (1753) 1124; DC. Prodr. VII, 102.—*Hedynois hispida* (L.) Smith, Fl. Brit. 2 (1824) 813.—*Apargia hispida* (L.) Host, Fl. austr. II (1831) 403.— *Ic.*: Smith, op. cit. t. 554; Rchb. Ic. Fl. Germ. XIX (1860) t. 1368, 1369; Javorka and Csapody, Iconogr. Fl. Hung. I (1929) 554, No. 3980.

218 Perennial. Rhizome short, somewhat truncate, horizontal or almost vertical, with numerous fibrous roots; scape straight, 10–60 cm high, scabrous from fine forked hairs, sometimes pinkish below, weakly thickened below capitulum, densely hairy, leafless or, less often, with one long leaf, mainly in upper part. Basal leaves 5–20 cm long, 1–3 cm wide, oblong or lanceolate, sinuate-toothed, incised-sinuate, covered with short, stiff, forked hairs, densely punctate-alveolate beneath with forked hairs on bottom, undulate-crisped in larger part, gradually narrowed toward base into rather long, sometimes pink, petiole. Capitula erect at flowering, drooping earlier, 1.2–3 cm wide at flowering; ligules yellow. Involucre bracts linear, linear-lanceolate, dark green; outer bracts divergent, setose, bristles simple, mixed with some forked hairs, arachnoid-hairy along margin above; receptacle squamose, hairy, slightly convex. Achenes 4–6 mm long, 0.75 mm wide, fusiform, with relatively short beak, erect or slightly curved, longitudinally sulcate; transversely rugose, light brown, lustrous; pappus two-rowed; bristles of outer row short, barbed, inner bristles plumose, up to 7 mm long, thickened, lustrous at base. Flowering June to August; fruiting July to September. (Plate XIII, Fig. 2.)

Valley meadows, mountain slopes, hills.—*European Part*: Karelia-Lapland, Dvina-Pechora, Ladoga-Ilmen, Upper Volga, Volga-Kama, Upper Dnieper, Middle Dnieper, Volga-Don, Upper Dniester, Bessarabia, Black Sea Region, ?Crimea, Lower Don; *Caucasus*: Ciscaucasia, Dagestan, Eastern, Western and Southern Transcaucasia. *General distribution*: Scandinavia, Central Europe, Atlantic Europe, Balkans-Asia Minor. Described from western Europe. Type in London.

14. *L. caucasicus* (M.B.) Fisch. Catal. Hort. Gorenk. (1812) 34; DC. Prodr. VII (1838) 104; Ldb. Fl. Ross. II, 781.—*Apargia caucasica* M.B. Fl. taur.-cauc. II (1808) 247.

Perennial. Rhizome reduced, with strong fibrous roots, very rarely creeping, long. Stem 14–50 cm high, glabrous, smooth, sulcate, slightly thickened and hairy only below capitulum, with one capitulum much longer than basal leaves and with 1–2 petiolate leaves. Basal leaves 3–20 cm long, 1–2.5(3) cm wide, sinuate-toothed, runcinate, with triangular uncinat lobes, smooth above, glabrous or with simple hairs, sometimes mixed with forked hairs, glabrous beneath, or only along midrib covered with simple scattered long hairs mixed with forked hairs. Involucre dark green, with whitish or yellowish simple hairs, as also upper part of stem; outer bracts subulate, others lanceolate-linear, acuminate, sparsely hairy. Corolla bright yellow. Achenes dark brown, sulcate, more or less flattened, slightly curved, transversely rugose, toothed; pappus dirty white, sessile, two-rowed; bristles of outer row short, barbed; inner bristles plumose, longer than achene, weakly thickened toward base. Flowering July to August; fruiting August to September.

Subalpine and alpine meadows, less often in forest zone in glades.—*Caucasus*: Ciscaucasia, Dagestan, Eastern, Western and Southern Transcaucasia. Described from Caucasus. Type in Leningrad.

Note. Undoubtedly close to *L. hispidus* L., from which it differs by having a smooth stem and smooth leaves with scattered simple hairs mixed with forked hairs. Apparently, a mountain form of *L. hispidus* L.

GENUS 1642. *Picris* L.^{1,2}

L. Sp. pl. (1753) 792.

Capitula many-flowered. Involucre imbricate, of lanceolate or linear bracts; outer bracts in several rows, short and recurved, inner bracts appressed, one- or two-rowed; outer bracts much shorter than inner.

¹ Treatment by V.N. Vassilev.

² Derived from the Greek word *picros*—bitter.

Achenes weakly terete, thinner at both ends, longitudinally and transversely sulcate; beak absent or very short, almost one-third as long as achene, less often almost as long; pappus two-rowed, with outer row of shorter, almost filiform bristles, inner bristles plumose, connate at base. Herbaceous annuals, biennials, less often perennials, with erect branched stems, covered with stiff uncinat hairs. Leaves entire, toothed, less often pinnatisect.

Type of genus: *Picris hieracioides* L.

The genus includes up to 40 species, distributed in the Mediterranean Region, Eurasia, and northern Africa.

1. Stem covered with simple as well as forked bristles or bristles with two anchor-shaped hooks above 2.
- + Stem covered with simple as well as forked bristles with three or (often) four anchor-shaped hooks 6.
2. Hairs light colored; corolla limb two to three times as long as tube; achenes reddish-brown, slightly narrowed at both ends, very weakly falcate, without beak, oblong-sulcate, transversely undulate-rugose, 3 mm long 1. ***P. hieracioides*** L.
- + Combination of characters different 3.
- 220 3. Hairs black, dark green; corolla limb less than two times as long as tube; achenes dark brown, weakly falcate, narrowed at both ends, longitudinally sulcate, transversely cristate-rugose, 4 mm long 2. ***P. japonica*** Thunb.
- + Combination of characters different 4.
4. Hairs black, somewhat dark but not light-colored; corolla limb slightly longer than tube; achenes weakly falcate, narrowed at both ends, with up to 5.5 mm-long weakly developed beak 3. ***P. kamtschatica*** Ldb.
- + Combination of characters different 5.
5. Branches upward-spreading; inflorescence compressed, umbellate; stem roundish; hairs light colored, strongly thickened below; achenes light- or dark-brown, slightly falcate, narrowed at both ends, longitudinally sulcate, transversely undulate-rugose, 4 mm long 4. ***P. rigida*** Ldb.
- + Branches strongly divaricate, inflorescence lax; stem sulcate, hairs light colored, slightly thickened below; achenes brown, up to 5 mm long, fusiform, with very short (0.3 mm long) beak, longitudinally sulcate, transversely undulate-cristate 5. ***P. similis*** Vassil.
6. Hairs with two anchor-shaped hooks; peduncles thickened above, abruptly narrowed directly below capitulum 6. ***P. pauciflora*** Willd.
- + Hairs with four hooks; peduncles equally thick throughout 7.

7. Plants strongly hairy; corolla limb as long as tube; achenes 5 mm long, fusiform, slightly falcate, longitudinally sulcate, dark, rather abruptly narrowed in up to 1.5 mm-long beak 7. **P. strigosa** M.B.
- + Plants sparsely hairy, mainly in lower part of stem; corolla limb two times as long as tube; achenes fusiform, 4 mm long, its beak up to 1 mm long, longitudinally sulcate, transversely undulate, with cristate membranous processes at apex and along beak 8. **P. canescens** (Stev.) V. Vassil.

Section Picris.—Sect. *Eupicris* Boiss. Fl. or III (1875) 734. Pappus of all achenes (outer and inner) similar.

Type of section: type of genus.

Series 1. *Hieracioides* V. Vassil. Biennial. Pubescence of simple forked hairs and hairs with two anchor-shaped hooks. Achenes without beak or with very short (0.2 mm long) beak. Peduncles uniformly thick throughout.

- 221 1. **P. hieracioides** L. Sp. pl. (1753) 792; DC. Prodr. VII, 128; Ldb. Fl. Ross. II, 798; Kryl. Fl. Zap. Sib. XI (1949) 2970.—*Leontodon umbellatus* Schrank, Baier. Fl. II (1789) 334.—*Apargia umbellata* (Schrank) Schrank in Denkschr. Regensb. Bot. Gesellsch. II (1918) 66.—*A. hieracioides* (L.) Willd. Sp. pl. III, 3 (1803) 1554.—*Picris aspera* Gilib. Fl. lithuan. III (1785) 227.—*Hedypnois hieracioides* (L.) Huds. Fl. Angl. (1762) 342.—**lc.**: Fedtsch. and Fler. Fl. Evrop. Ross. (1910) 1041; Javorka and Csapody, **lc.** Fl. Hung. I (1929) 555, No. 3987.

Biennial. Stem erect, often more or less branched above, 50–100 cm high, as also leaves, covered with one-third to three-fourths mm-long, erect, stiff hairs, usually uncinatate at apex. Basal leaves withering before anthesis; lower cauline leaves short-petiolate, linear-elliptical or broadly lanceolate, almost entire or sinuate-toothed, sometimes with narrow elongated teeth, 8–20 cm long, 0.5–6 cm wide; middle and upper leaves lanceolate, less often elliptical-lanceolate, sessile, semiamplexicaul, finely toothed, less often sinuate-toothed; uppermost leaves usually entire. Capitula in corymbose or corymbose-paniculate inflorescence, up to 1.5 cm long and 1.5 cm wide at flowering and fruiting; involucre bracts dorsally covered with appressed arachnoid hairs and stiff, up to one-third to three-fourths mm long, appressed setose hairs, ciliate along margin. Florets bright yellow; corolla finely pubescent at base of limb; limb two to three times as long as tube; style pilose. Achenes yellowish or light brown, 3 mm long, falcate. Flowering July to August; fruiting August to September (Plate XIV, Fig. 2).

Forest, floodplain and steppe meadows, smooth stony slopes, forest edges, sometimes in crops.—*European Part*: Ladoga-Ilmen, Baltic Region, Upper Volga, Volga-Kama, Upper Dnieper, Upper Dniester, Middle Dnieper (northern part), Volga-Don, Trans-Volga Region (northern part); *Caucasus*: Ciscaucasia, Dagestan, Western and Southern Transcaucasia; *Western Siberia*: Ob', Upper Tobol, Irtysh; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region. *General distribution*: Scandinavia, central and Atlantic Europe, Mediterranean Region, Balkans-Asia Minor, Armenia and Kurdistan, Iran. Described from western Europe. Type in London.

Note. M.G. Popov (*Ocherk Rast. i. Fl. Karpat.* (1949) 254) segregated the eastern Carpathian specimens of this species as a separate subspecies: *P. hieracioides* ssp. *carpatica* M. Pop.

2. ***P. japonica*** Thunb. Fl. Jap. (1784) 299; DC. Prodr. VII, 130; Ldb. Fl. Ross. II, 800, p. p., excl. pl. Kamtsch.; Kom. Fl. Manch. III, 2, 766.—*P. dahurica* Fisch. ex Hornem. Hort. Hafn. Suppl. (1819) 155; DC. Prodr. VII, 129.—**Ic.**: Miyoshi and Makino, Pocket-Atlas Alp. pl. jap. II (1907) t. 66, fig. 381; Somoku Dzusetsu, ed. Makino (1912) t. 6.

222 Biennial. Stem erect, usually slender, up to 1 m high, branched above, with sparse pubescence of stiff, erect, black hairs, majority with anchor-shaped tips. Cauline leaves sessile, oblong or oblong-lanceolate, acute, usually indistinctly toothed, less often sinuate-toothed, scabrous throughout from stiff setose hairs; basal leaves withering before anthesis. Peduncles slender; capitula up to 1.5 cm long, 1–1.5 cm wide, in lax corymbose panicle; involucre bracts dark green; peduncles and stem in upper part with fine appressed, soft, white, crisped hairs and also a large or small number of light colored or dark gray setose hairs, many with anchor-shaped tips. Corolla bright yellow; ligules less than two times as long as tube, with darker teeth; limb at base sericeous. Achenes 3–4 mm long, dark brown, longitudinally and transversely sulcate, slightly falcate, narrowed at both ends; pappus two-rowed, dirty white, readily detached; bristles of outer row short, barbed, forked; inner bristles longer, plumose. Flowering June to August; fruiting August to September (Plate XIV, Fig. 4).

Dry meadows, meadow slopes, shrubby thickets. —*Western Siberia*: Ob', Irtysh, Altai; *Eastern Siberia*: Yenisei, Angara-Sayans, Dauria; *Far East*: Zeya-Bureya, Uda River area, Ussuri, Sakhalin, Kuril Islands; *Soviet Central Asia*: Balkhash Region, Dzhungaria-Tarbagatai, Tien Shan (northern). *General distribution*: China, Japan. Described from Japan. Type in Uppsala.

Note. The ranges of *P. japonica* Thunb. and *P. hieracioides* L. are contiguous in western Siberia, Kazakhstan, and the Yenisei territory. As a result, plants with intermediate characters are found where they come

in contact. A form with long thin leaves and longer (up to 4.5 mm) achenes occurs in China (Hansu Province): var. *chinensis* V. Vassil. (foliis tenuioribus longioribusque acheniis longioribus).

V.N. Woroshilov (*Byull. Glavn. Bot. Sada Akad. Nauk SSSR*, 49, 1963, 58) determined the distribution of *Picris coreana* (Kitam.) Worosch. (*P. japonica* var. *coreana* Kitam.) in the south of the Ussuri District. It also occurs in Korea and northeastern China. It differs from, *P. japonica* Thunb. by having a green involucre and light yellowish corolla.

3. ***P. kamtschatica*** Ldb. in Mém. Acad. Sc. Pétersb. V (1815) 557. —*P. hieracioides* subsp. *kamtschatica* (Ldb.) Hult. Fl. of Kamtch. IV (1930) 217. —*P. japonica* auct. non Thunb. Kom. Fl. Kamch. III (1930) 185. —**Ис.:** Takeda, Ic. Jap. alp. pl. t. 19.

Biennial. Stem erect, up to 1 m high, thick, branched above, as also leaves, densely covered with erect, stiff, setose, blackish hairs, mostly with anchor-shaped tips. Basal leaves withering early; cauline leaves sessile, oblong, acute, indistinctly toothed. Capitula 2–2.5 cm long, up to 2 cm wide, on densely pubescent, distinctly thickened peduncles above, in lax panicle or in compressed leafy corymb. Involucral bracts dark, 223 two-rowed, pubescent with long erect blackish hairs; outer bracts short, usually divergent; inner bracts long, appressed. Corolla bright yellow; limb slightly longer than tube. Achenes 6–7 mm long, scabrous, narrowed above into short beak; pappus dirty white, two-rowed, as long as achene, readily detached; bristles of outer row shorter, with few branches; inner bristles longer, plumose. Flowering July to September; fruiting August to September. (Plate XIV, Fig. 3.)

Coastal slopes and banks, landslides on mountain slopes; scattered.—*Far East:* Kamchatka (and Bering Island). *General distribution:* Japan. Described from Kamchatka. Type in Leningrad.

4. ***P. rigida*** Ldb. in Spreng. Syst. veg. III (1826) 663; Ldb. Fl. Ross. II 800. —*P. hieracioides* var. *canescens* Zing. Sborn. Sved. po Fl. Sredn. Ross. (1885) 271.

Biennial. Stem erect, branched usually above, 30–80 cm high, as also leaves, especially in lower half, covered with stiff, simple or anchor-shaped white hairs with two hooks, at right angle to main stem and strongly thickened below. Leaves sinuate-toothed to entire; rosette of basal leaves usually persistent even after flowering; basal leaves lanceolate, linear-lanceolate, on winged petioles more or less as long as lamina; cauline leaves sessile, semiamplexicaul, lower ones broadly lanceolate, middle lanceolate, upper leaves linear-lanceolate, small. Capitula in terminal umbellate panicle, sometimes on very short peduncles (var. *brachypoda* DC.), sometimes on axillary branches, up to 1.5 cm long at

1 cm wide, up to 12 cm long and 1.5 cm wide, at fruiting. Involucral bracts covered with short grayish fluff and light-colored, short, strongly thickened below, usually appressed setose hairs along margin and keel, imbricate; inner bracts narrowly lanceolate, appressed; outer bracts linear, sometimes strongly deflexed. Florets yellow; corolla tube at least one-third as long as limb; limb sericeous below; ligules with five narrow, up to 1 mm long, teeth. Achenes 4–5 mm long, longitudinally and transversely striate, slightly curved, narrowed at both ends, dark- or light-brown; pappus two-rowed; its bristles connate at base, 7 mm long; outer bristles short, barbed; inner bristles long, plumose. Flowering July to September; fruiting August to September (Plate XIV, Fig. 1).

Sands, gravels, stony and rubbly slopes, weedy places.—*European Part*: Upper Dnieper, Middle Dnieper, Volga-Don (southern part), Trans-Volga Region (southern part), Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga, *Western Siberia*: Upper Tobol (southern part), Aralo-Caspian. Described from Crimea and Taganrog. Type and cotype in Leningrad.

5. **P. similis** V. Vassil. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XVII (1955) 459.

224 Annual or biennial. Stem 10–130 cm high, solitary (or several arising from rootstock), usually divaricately branched, with long slender, more or less sulcate branches, with scabrous erect hairs having two anchor-shaped hooks. Leaves lanceolate, linear-lanceolate, linear, with stiff anchor-shaped and forked hairs; basal leaves persistent even after anthesis, narrowed into winged petiole; cauline leaves sessile, reduced and narrowed toward stem apex. Peduncles slender, uniformly thick throughout. Capitula in very lax panicles, small, oblong, 7–10 mm wide before flowering, up to 15 mm at fruiting, 1–1.5 cm long. Outer involucral bracts small, narrow, horizontal or deflexed; bracts of two inner rows as long as pappus, broadly scarious along margin, pubescent along keel; outer bracts arachnoid-hairy and with stiff hairs throughout. Achenes up to 5 mm long, about 1 mm thick, fusiform, longitudinally sulcate, transversely undulate-rugose, brown; pappus up to 6 mm long, two-rowed, of plumose hairs, connate below into ring. Flowering June to August; fruiting July to August (Plate XIV, Fig. 5).

Stony, rubbly slopes, sands and gravelly areas in river valleys.—*Soviet Central Asia*: Aralo-Caspian, Balkhash Region, mountainous Turkmenia, Amu-Darya, Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: China (eastern Tien Shan). Described from Soviet Central Asia. Type in Leningrad.

Series 2. Pauciflorae V. Vassil. Annuals. Hairs simple and with two anchor-shaped hooks. Peduncles thickened upward, abruptly narrowed

below capitulum. Achenes abruptly narrowed into up to 1 mm-long beak.

Besides our species, this series includes *P. kotschyi* Boiss. from Asia Minor.

6. ***P. pauciflora*** Willd. Sp. pl. III, 3 (1803) 1557.—*Crepis lappacea* Willd. op. cit. 1599. —*Medicusia lappacea* (Willd.) Rchb. Fl. Germ. exc. (1830) 254.—**lc.**: Rchb. Ic. Fl. Germ. XIX (1858) t. 1373.

Annual. Stem 10–50 cm high, branched, scabrous from simple and anchor-shaped hairs with two hooks. Leaves 0.5–1 cm wide, oblong-lanceolate, toothed, sinuate-toothed or entire, with simple, forked and anchor-shaped stiff hairs; lower leaves petiolate, upper leaves sessile, lanceolate-linear. Peduncles thickened above, abruptly narrowed below 226 capitulum. Capitula solitary at apices of branches 0.6–1 cm thick, 1–1.3 cm long, somewhat constricted in middle at fruiting. Involucre imbricate; inner bracts compactly appressed, linear-lanceolate, setose-ciliate, deeply furrowed at fruiting, with convex keel on back side; outer bracts linear, usually more or less deflexed or uncatate. Corolla almost two times as long as involucre, pale yellow; limb almost two times as long as tube, with few hairs at base. Achenes 4 mm long, arcuate, narrowed at base, abruptly narrowed upward into 1 mm-long beak, with five deep longitudinal furrows, sharply transversely rugose; pappus plumose, two-rowed, with bristles connate at base; outer bristles shorter. Flowering May to June; fruiting June to July. (Plate XIV, Fig. 7.)

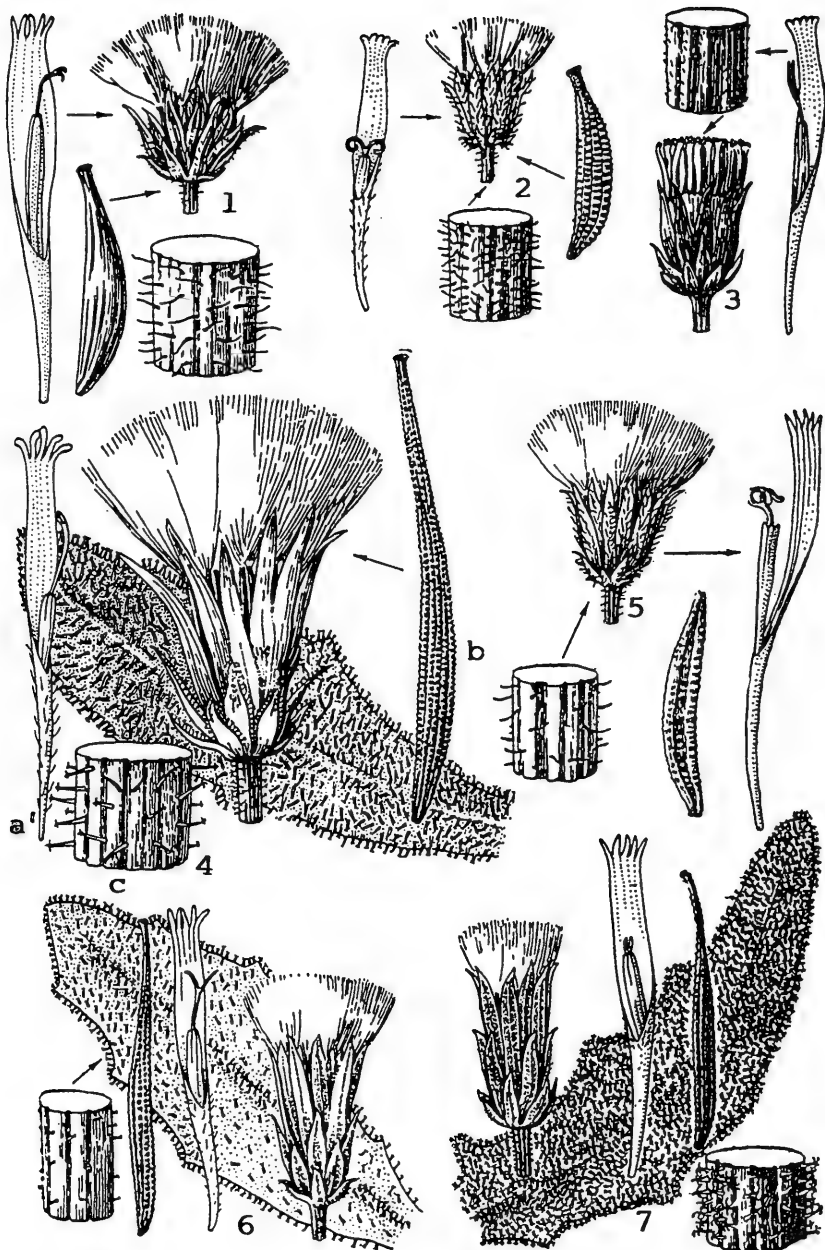
Dry stony habitats, often as weed.—*European Part*: Crimea; *Caucasus*: Ciscaucasia, ?Dagestan, Western and Southern Transcaucasia. *General distribution*: central Europe, Atlantic Europe, Mediterranean Region, Balkans-Asia Minor, ?Armenia and Kurdistan, Iran. Described from France, Type in Berlin.

Series 3. Strigosae V. Vassil. Annuals and biennials. Hairs simple and with four anchor-shaped hooks. Peduncles uniformly thick throughout. Achenes rather abruptly narrowed into 1.5 mm long beak.

Besides the two species of our flora, this series also includes *P. sprengeliana* (L.) Lam.

7. ***P. strigosa*** M.B. Fl. taur.-cauc. II (1808) 250, III (1819) 532; Grossh. Fl. Kavk. IV (1934) 223.—*L. glaucescens* DC. Prodr. VII (1838) 130.

Stem 25–80 cm high, strongly (sometimes from base) branched, four- or five-angled, with branches canescent from short appressed hairs, scabrous (especially below) from stiff, erect, anchor-shaped hairs with three or four hooks. Lower leaves oblong-lanceolate, runcinate, up to



10 cm long, petiolate; upper and middle leaves linear-lanceolate, at base narrowed, not amplexicaul; all leaves more or less covered with anchor-shaped and forked light-colored hairs. General inflorescence with many, scattered, small capitula at apices of branches, 5–6 mm wide before flowering, up to 1.5 cm wide and about 1 cm long at anthesis and fruiting. Capitula many-flowered. Involucre, besides gray tomentum, covered with stiff, setose, simple and anchor-shaped, hooked hairs, two-rowed; outer bracts narrow, deflexed; inner bracts broader, appressed, scarious along margin. Florets pale yellow; limb at base pubescent, as long as corolla tube, ligules with five darker teeth. Achenes 5 mm long, longitudinally sulcate, transversely undulate, dentate above, fusiform, weakly arcuate, dark, rather abruptly narrowed into short (up to 1.5 mm-long) beak; pappus dirty-white. Flowering May to August; fruiting June to September. (Plate XIV, Fig. 6.)

Rocks, dry slopes and meadows. —*European Part*: Crimea; *Caucasus*: Ciscaucasia, Dagestan, Eastern, Western and Southern Transcaucasia, Talysh; *Soviet Central Asia*: mountainous Turkmenia (Kopetdag). *General distribution*: Balkans-Asia Minor, Armenia and Kurdistan, Iran. Described from the Caucasus. Type in Leningrad.

8. ***P. canescens*** (Stev.) V. Vassil. comb. nova.—*P. laevis* C.A. Mey. Verzeichn. Pfl. Cauc. (1831) 59; Ldb. Fl. Ross. II, 3, 801.—*Hypochaeris canescens* Stev. in Mém. Soc. Nat. Mosc. IV (1813) 100 and in M.B. Fl. taur.-cauc. IV (1819) 539.—*Dickera canescens* (Stev.) C.A. Mey. Ind. Sem. Hort. Petrop. IV (1837) 34.

Annual or biennial. Stem erect or ascending, strongly branched, often from base, 25–40 cm high, with basal rosette of leaves, usually as also leaves, glabrous or only at base with stiff erect hairs, with two, three or four anchor-shaped hooks at tip. Leaves more or less linear, sinuate-toothed; upper leaves linear, entire; basal leaves petiolate; cauline leaves short-petiolate or sessile, 3–10 cm long, 0.3–2.5 cm wide. Capitula in panicles, numerous, up to 2 cm long and up to 1.5 cm wide at flowering. Involucral bracts flat, with appressed arachnoid pubescence, less often with a few stiff, setose, simple hairs. Florets yellow; corolla pubescent at limb base; corolla tube half as long as limb. Style short-setose. Achenes up to 4 mm long, dark brown, weakly arcuate, fusiform, with short (up to 1 mm) beak, longitudinally sulcate, transversely undulate, with cristate projections at apex and along beak. Flowering July to August; fruiting July to September.

Along riverbanks, in stony places.—*Caucasus*: Ciscaucasia (eastern), Dagestan. Described from Ciscaucasia (Terek Valley). Type in Leningrad.

Note. It is close to *P. strigosa* M.B., with which it shares the presence of hairs with four anchor-shaped hooks, but well differentiated from it in

being weakly hairy throughout (sometimes completely lacking pubescence), and having flat involucre bracts, and a shorter achene with a shorter beak. The possibility of a hybrid origin (*P. strigosa* M.B. × *P. rigida* Ldb.) cannot be excluded.

GENUS 1643. *Helminthia* Juss.^{1,2}

Juss. Gen. pl. (1774) 170.

Involucre two-rowed; inner row of eight narrow bracts; outer row of three to five small, wide bracts. Receptacle without scales. All florets
228 ligulate, yellow. Achenes flattened-terete, transversely striate, obtuse in upper part, rugose, narrowed into filiform beak; pappus one-rowed, its bristles simple, persistent. Leaves oblong, semiamplexicaul. Stem strongly branched. Leaves and capitula with stiff setose hairs. Annuals or biennials.

Type of genus: *Helminthia echioides* (L.) Gaertn. An oligotypic Mediterranean genus.

1. *H. echioides* (L.) Gaertn. De fruct. II (1791) 368.—*Picris echioides* L. Sp. pl. (1753) 792. —*Helminthia humifusa* Trev. in Nova Acta Acad. Caes. Leopold. Carol. Nat. Cur. 13, I (1826) 195.—**lc.**: Gaertn. op. cit. t. 159, f. 2; Javorka and Csapody, Ic. Fl. Hung. I (1929) 555, No. 3985.

Annual. Stem 3–8 mm thick, erect or prostrate, often branched from base, covered with uncinatate or forked stiff setose hairs. Leaves oblong-lanceolate, entire or sinuate-toothed; basal leaves petiolate; cauline leaves amplexicaul, auriculate. Capitula crowded in groups of two to five at branch apices, on short peduncles. Outer involucre bracts oval-cordate, acuminate, inner narrowly linear, subulately long-acuminate, stiff-hairy or ciliolate. Achenes oblong, finely rugose, abruptly narrowed above into slender, fragile beak, patelliform-broadened above, with white, one-rowed pappus of plumose hairs. Flowering June to July; fruiting July to August (Plate XII, Fig. 7).

A weed in cultivated fields, roadsides.—*European Part*: Crimea; *Caucasus*: Dagestan, Eastern Transcaucasia; *Soviet Central Asia*: mountainous Turkmenia (introduced?). *General distribution*: central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, Armenia and Kurdistan, Iran and Afghanistan, North and South America (introduced?). Described from western Europe. Type in London.

¹ Treatment by V.N. Vassilev.

² From the Greek word *elmis*—worm; so named on the basis of the striate achenes.

GENUS 1644. *Urospermum* Scop.^{1,2}

Scop. Introd. hist. nat. (1777) 122.

Capitula solitary, large, at apices of main stem and lateral branches. Involucral bracts similar, eight, connate at base. Receptacle glabrous, alveolate. All florets ligulate, grayish-yellow, with five brown teeth at apex; outer florets with purple tinge. Achenes transversely striate, curved, with hollow basally swollen beak; pappus one-rowed, its bristles plumose. Annual herbs; stem simple or with few lateral branches, glabrous or with stiff hairs, leafy; lower leaves petiolate, middle and upper leaves sessile, amplexicaul, toothed, pinnatifid or entire.

Type of genus: *U. picroides* (L.) Desf.

- 229 An oligotypic genus, comprising only four species, three of which are confined to the Mediterranean Region, and one is occurs in South Africa.

1. *U. picroides* (L.) Desf. Catal. Hort. Paris, ed. 1 (1820) 90; Ldb. Fl. Ross. III 790; Boiss. Fl. or. III, 743.—*U. asperum* (L.) DC. Fl. France, ed. 3, IV, 1 (1805) 63.—*Tragopogon picroides* L. Sp. pl. (1753) 790.—*T. asperum*. L. Ibid. 790.—*Arnogon picroides* Willd. Sp. pl. III (1803) 1496.—*A. asper* Willd. op. cit. 1497.—**Ic.**: Rchb. Ic. Rchb. Ic. Fl. Germ XIX, t. 1377.

Annual. Stem erect, 15–40 cm high, hispid; simple or weakly branched. Leaves thin; lower leaves petiolate, oblong-spatulate, lyrate; middle and upper leaves sessile, amplexicaul, auriculate, oblong or ovate, acutely sharp-toothed, pinnatifid, less often entire, hispid beneath along veins. Capitula (one) three to five, on long peduncles, at apices of main stem and branches, large, 1.7–3.0 cm long, up to 15 mm wide at flowering; up to 3 cm wide with mature fruits; involucre one-rowed, of eight basally connate, up to 2 cm long, lanceolate bracts with narrow white membranous margin, glabrous or with few setaceous hairs; ligules pale yellow, with five apical teeth; receptacle without scales, alveolate. Achenes with pappus up to 2.5 cm long; pappus readily detached, one-rowed, of white plumose bristles; beak, up to 11 mm long, swollen below, hollow, dark brown, making obtuse angle with achene; achenes without beak and pappus 4–5 mm long, curved, flat, with punctate tubercles along margin, light brown. Flowering April to June; fruiting May to June. (Plate XII, Fig. 5.)

Mountain slopes on stony soils, among shrub thickets and citrus plantations.—*Caucasus*: Eastern Transcaucasia. *General distribution*:

¹ Treatment by V.N. Vassilev.

² Name derived from the Greek words *ura*—tail, and *sperma*—seed.

Mediterranean Region, Balkans-Asia Minor, Armenia and Kurdistan, Iran. Described from southern Europe. Type in London.

GENUS 1645. **Hedypnois** Schreb.^{1,2}

Schreb. Gen. pl. II (1791) 532.

Capitula many-flowered, solitary. Receptacle glabrous. Involucre two-rowed; outer involucre bracts few, short; inner bracts several times as long as outer, at fruiting hardening and enclosing outer achenes. Ligulate florets yellow, exceeding involucre. Outer achenes slightly curved, terete, finely ribbed, with toothed membranous crown at apex; inner achenes straight, with pappus of lanceolate-subulate serrate bristles.

230 Type of genus: *H. cretica* (L.) Willd.

1. Involucral bracts glabrous, smooth 1. **H. cretica** (L.) Willd.
- + Involucral bracts hispid 2. **H. persica** M.B.

1 **H. cretica** (L.) Willd. Sp. pl. III, 3 (1800) 617; DC. Prodr. VII, 1, 81; Ldb. Fl. Ross. II, 2, 773; p. p. Boiss. Fl. or. III, 719; Grossh. Fl. Kavk. IV (1935) 225.—*Hyoseris cretica* L. Sp. pl. (1753) 810.

Annual. Stems usually dichotomously branched, less often simple, with scattered hairs, sometimes almost glabrous. Basal and lower cauline leaves oblong or oblong-spatulate, on winged petiole, hispid, more or less toothed, to sinuate-toothed; cauline leaves oblong-lanceolate, sessile. Capitula solitary, at apices of branches and main stem, on long, upwardly thickened peduncles, fistular above. Involucral bracts oblong-lanceolate, glabrous or finely scatteredly puberulent, hardening at fruiting, carinate, enclosing outer achenes. Achenes linear-cylindrical, 6–7 mm long; outer achenes with short, membranous, toothed corona at apex, inner achenes with pappus of membranous, lanceolate-subulate, finely toothed, 3–4 mm long bristles. Flowering April to May; fruiting May to June (Plate I, Fig. 1).

Roadsides, in gardens, vineyards, on clayey slopes, sometimes in fields.—*European Part*: Crimea (southern coast); *Caucasus*: Eastern and Southern Transcaucasia, Talysh. *General distribution*: Mediterranean, Asia Minor. Described from Island of Crete. Type in London.

Note. This species is more mesophilous than *H. persica*. In Crimea, it is found in the coastal belt in the south and in the Caucasus only under high moisture conditions (irrigated fields, etc.).

¹ Treatment by I.T. Vassilchenko.

² From the Greek words *hedys*—sweet, and *pnois*—smell (on the basis of the aromatic odor of the plant).

2. **H. persica** M.B. Fl. taur.-cauc. III (1819) 539; Boiss. Fl. or. III, 719.—*H. cretica* auct. non Willd.; Ldb. Fl. Ross. II, 2 (1845–1856) 733, p. p.

Annual. Stem 5–25 cm high, leafy, usually branched from base; all plant parts (except corolla) hispid. Basal leaves oblong, on long and thickened petioles, sinuate-toothed, with triangular remote teeth sometimes weakly developed; cauline leaves oblong-lanceolate, amplexicaul, sessile, sinuate-toothed, but with narrower teeth. Capitula solitary, at apices of main stem and its branches, on long, upwardly clavately thickened and fistular peduncle. Involucral bracts densely hispid, carinate at fruiting, hardened, with whitish pappillae and spinules in middle on dorsal surface, densely covered with long stiff hairs and shorter hairs throughout on outer surface, inner side glabrous, enclosing outer achenes. Achenes linear-
231 cylindrical, finely pilose, with indistinct longitudinal ribs, dark brown; outer achenes with erose-toothed corona; inner achenes with pappus of membranous bristles. Flowering May.

Dry stony and clayey slopes, in plains and foothills, sometimes as weed of roadsides, among crops, etc.—*Caucasus*: Eastern and Southern Transcaucasia, Dagestan. *General distribution*: Iran, Balkans-Asia Minor, eastern Mediterranean Region. Described from Derbent. Type in Leningrad.

GENUS 1646. **Garhadiolus** Jaub. and Sp.^{1,2}

Jaub. and Sp. III, pl. or. III (1847–1850) 119.

Capitula few-flowered, short-cylindrical. Receptacle glabrous; involucre two-rowed, of inner long, linear-lanceolate bracts and outer very small, inconspicuous bracts, latter hardening at fruiting, incurved along margin and more or less firmly enclosing lower part of outer achenes. Ligules yellowish, slightly lower than involucral bracts. Achenes terete, thickened below, more or less curved, with short pappus at apex. Annual herbs with simple, more or less toothed (to lobate and pinnatifid) leaves.

Type of genus: *G. angulosus* Jaub. and sp.

The genus includes four or five species, out of which two are found in the USSR.

- 1 Inner achenes with long beak and somewhat long pappus; peripheral achenes narrowed at apex, with corona of very short bristles, bend of achene closer to its base; inner involucral bracts

¹ Treatment by I.T. Vassilczenko.

² Anagram of *Rhagadiolus* (cf.).

- usually spinose, sometimes lacking spines
 1. **G. papposus** Boiss. and Buhse
 + All achenes narrowed at apex and with small fimbriate corona;
 peripheral achenes bent (at right angle) above; involucre bracts
 smooth or, less often, more or less setose
 2. **G. angulosus** Jaub. and sp.

1. **G. papposus** Boiss. and Buhse in Nouv. Mém. Soc. Nat. Mosc. XII (1860) 135; Boiss. Fl. or. III, 723; Grossh. Fl. Kavk. IV (1935) 226; Nevski in Sorn. Rast. SSSR IV, 318; O. and B. Fedtsch. Perech. Rast. Turk. 4 (1911) 305; Kovalevskaja in Fl. Uzb. VI (1962) 426.—*G. scaberrimus* Franch. ex O. and B. Fedtsch. Perech. Rast. Turk. 4 (1911) 306.—*G. echinatus* Pavl. in Vestn. Akad. Nauk Kazakh. SSR 3 (1950) 27.—*Rhagadiolus papposus* O. Ktze. in Tr. Peterb. Bot. Sada X (1887) 205.—*Koelpinia scaberrima* Franch. in Ann. Sc. Nat. VI ser. 15, (1883) 331.—**lc.**: Boiss. and Buhse op. cit. t. 7; Kovalevskaja op. cit. Plate 51, Fig. 1.

232 Annual. Stems usually branched, ascending, 5–40 cm high, more or less hairy or almost glabrous, sometimes whole plant hispid (var. *scaberrimus* (Franch.) Vass.), Basal and lower cauline leaves oblong or oblong-ovate, petiolate, more or less unevenly sinuate-toothed to lyrate pinnatilobate and pinnatipartite, setose at least beneath along veins; cauline leaves like basal, but sessile and reduced. Capitula terminal and axillary. Inner involucre bracts lanceolate, more or less convexo-concave, usually setose on outer side (sometimes glabrous), and often also arachnoid-woolly, hardening at fruiting, carinate, short, more or less setose-spinose on dorsal side, tuberculate or smooth (var. *suberculatus* Vass.), enclosing outer achenes, latter more or less bent (to more or less straight), with slender beak and pappus of short, white, finely barbed bristles; all achenes puberulent, hairs appressed. Flowering March to April.

Plains and foothills.—*Caucasus*: Ciscaucasia (eastern part), Dagestan, Eastern and Southern Transcaucasia; *Soviet Central Asia*: All regions. *General distribution*: Iran, Armenia and Kurdistan. Described from southern Transcaucasia. Type in Geneva.

Note. The hispid plants have been treated by some authors as a separate species (*C. scaberrimus* Franch., *G. echinatus* Pavl.), which is not justified, as it is only the variety typical of more or less light soils (sand, stony soils, etc.). The Herbarium of the Botanical Institute, Academy of Sciences of the USSR, has plants which were identified as *G. scaberrimus* Franch. by B.A. Fedtschenko already in 1915. Besides this hispid variety, there is another variety with smooth outer involucre bracts, as if made of cork (from which the name var. *suberculatus* is derived). This variety is found under conditions of a better and, apparently, sure

moisture supply. Both varieties are found throughout the range of the species and are connected to each other and to typical *G. papposus* by intermediates.

2. *G. angulosus* Jaub. and Sp. III. pl. or. III (1849) 12; Koyalevskaja in Fl. Uzb. VI (1962) 427.—*G. hedypnois* (Fisch. and Mey.) Jaub. and Sp. III. pl. or. III (1849) 120; Boiss Fl. or. III, 723; Grossh. Fl. Kavk. IV (1934) 225; Nevski in Sorn. Rast. SSSR IV, 318.—*G. minutissimus* Kitamura in Acta Phytotax. et Geobot. XVII (1957) 75 *Rhagadiolus hedypnois* Fisch. and Mey. ex DC. Prodr. VII (1938) 78 and in Ind. Sem. hort. Petrop. IV (1838) 46; Ldb. Fl. Ross. II, 2, 772; O. and B. Fedtsch. Perech. Rast. Turk. 4 (1911) 305, non All. (1785). *Koelpinia hedypnois* H. Baill. in Ann. Sc. Nat. sér. 16 (1883) 330.—*Hedypnois minutissima* Bge. in Mém. Ac. Sc. Pétersb. VII (1851) 372. —**lc.**: Jaub. and Sp. op. cit. t. 284.

- 233 Annual. Stem simple or dichotomously branched, 5–20 cm high, pubescent with almost scaly hairs below (or throughout). Basal and lower cauline leaves oblong-obovate, more or less sinuate-toothed to divided, petiolate; cauline leaves ovate or obovate-lanceolate, sessile, toothed; all leaves glabrous or hispid (mostly along margin and along veins beneath). Capitula small, terminal on peduncles thickened in upper part; axillary capitula almost sessile. Involucral bracts glabrous or densely pubescent (var. *lipskyanus* m.); outer involucral bracts conduplicate at fruiting, hardened, 7–9(11) mm long, glabrous or setose. Achenes 4–6 mm long, about 4 mm wide, grayish-dark-brown, indistinctly longitudinally ribbed, somewhat remote (narrow flabellate above in capitulum); peripheral achenes half to two-thirds enclosed in involucral bracts, bent above in free part almost at right angle; inner achenes free, thicker, curved (to annular); achenes more or less finely setose (inner or all) or glabrous, with fimbriate corona at apex. Flowering April to May.

Loess plains, foothills (extending up to 1,500–2,000 m), usually as weed in fields.—*Caucasus*: Eastern and Southern Transcaucasia; *Soviet Central Asia*: Syr-Darya, Amu-Darya, Pamiro-Alai, Tien Shan, mountainous Turkmenia. *General distribution*: West Asia (including Afghanistan). Described from Transcaucasia, from the Beshbarmak Mountains. Type in Leningrad.

GENUS 1647. *Rhagadiolus* Scop.^{1,2}

Scop. Introd. (1777) 122.

¹ Treatment by I.T. Vassilchenko.

² From the Greek word *rhagas*—slit (involucral bracts with slit-like, indistinct depression).

Capitula many-flowered, Receptacle glabrous. Involucre two-rowed; outer involucre bracts five, small, ovate-triangular, concavo-convex, inner bracts five to eight, much longer, linear, in fruit expanded and hardened, enclosing outer, stellately arranged achenes. Corolla yellow. Outer achenes linear-subulate, narrowed above, more or less falcate; inner achenes terete, usually strongly curved, up to annular; all achenes without pappus.

Type of genus: *R. edulis* Gaertn.

The genus includes five or six species distributed in the Mediterranean Region and West Asia.

1. Basal and lower cauline leaves lyrate-pinnatifid or pinnatisect; involucre bracts smooth 1. ***R. edulis*** Gaertn.
- 234 + Basal and lower cauline leaves more or less sinuate-toothed, entire; involucre bracts dorsally setose ... 2. ***R. hebelaenus*** (DC.) Vass.

1. ***R. edulis*** Gaertn. De Fruct. et Sem. Pl. II (1791) 354; Willd. Sp. pl. III, 1625; M.B. Fl. taur.-cauc. III, 541.—*R. lampsanaefolius* Mirb. Hist. Nat. Pl. XI (1805) 328.—*R. stellatus* Y. *edulis* DC. Prodr. VII, 1 (1838) 77; Ldb. Fl. Ross. II, 2, 772.—*Lampsana rhagadiolus* L. Sp. pl. I (1753) 912.—**Exs.**: Dörfler Herb. Norm. No. 3060 (sub *R. rhagadiola* (L.) Dörf.).

Annual. Stem 5–30(40) cm high, simple or weakly branched, glabrous. Basal (and lower cauline) leaves with winged petioles, lyrate-pinnatifid or pinnatisect; terminal lobe large, brownish, ovate-reniform, more or less angular, lateral lobes much smaller, broadly ovate; leaves scatteredly hairy beneath and along petiole; cauline leaves sessile or subsessile, oblong-rhombic or oblong-lanceolate, more or less sinuate-toothed; uppermost leaves narrow-oblong, weakly toothed to almost entire. Capitula small, apical and axillary; involucre bracts smooth; florets exceeding involucre by one-third to three-fourths. Achenes stellately arranged, linear-terete; outer achenes enclosed in hardened and connate involucre bracts, straight, usually weakly uncinately only at apex, 8–15 mm long; inner achenes annular, densely and finely pubescent. Flowering April to May.

A weed of roadsides on slopes, near fences, buildings, in kitchen gardens, etc.; apparently only an adventive in our flora. —*European Part*: Crimea; *Caucasus*: Western Transcaucasia. *General distribution*: Mediterranean Region, Balkans-Asia Minor. Described from the Orient. Type in London.

2. ***R. hebelaenus*** (DC.) Vass. comb. nov. — *R. stellatus* d. *hebelaenus* DC. Prodr. VII, 1 (1838) 78; Boiss. Fl. or. III (1875) 722.

Annual. Plants 5–25(30) cm high with weakly branched stem, puberulent, more sparsely above, sometimes almost glabrous. Basal and

lower cauline leaves on wide (winged) petioles, more or less sinuate-toothed, to pinnatifid and divided, puberulent; upper cauline leaves sessile, lanceolate or oblong-lanceolate, toothed to entire, finely hairy. Capitula terminal and axillary. Inner involucre bracts dorsally covered with light-colored, erect scaly bristles. Peripheral achenes terete, stellately arranged, (10)12–15 mm long, more or less falcate (resembling achenes of *Koelpinia linearis* in form, but smooth), enclosed in expanded and hardened involucre bracts with bristles or tubercles on dorsal surface; inner achenes terete, more or less annular, densely and finely pubescent. Flowering April to May.

- 235 Cultivated fields, dry slopes, roadsides, plains and lower foothills (up to 200–300 m).—*Caucasus*: Dagestan, Eastern and Southern Transcaucasia. *General distribution*: eastern Mediterranean, Balkans-Asia Minor. Described from Greece. Type in Paris.

Subtribe 5. Lactucinae Less. Synops. Compos. (1832) 135 (“Lactuceae”); DC. Prodr. VII, 1 (1838) 133; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 222.—Trib. *Lactuceae* sect. 1. *Archetypae* Cass. in Dict. sc. nat. XXV (1822) 60, p. min. p.; sect. 2. *Crepideae* Cass. op. cit. 61. p. p.; sect. 3. *Hieracieae* Cass. op. cit. c. 63, p. p.—Trib. *Lactucées* sect. 1. *Prototypes* III. *Prototypes vraies* Cass. in Dict. sc. nat. XLVIII (1827) 422; sect. 2. *Crépideés* II. *Crépideés vraies* Cass. ibid. sect. 3. *Hiéracieés* Cass. ibid. p. max. p.—Trib. *Lactuceae* subtrib. *Lactuceae archetypael* (Cass.) Dum. Fl. Belg. (1827) 59; subtrib. *Crepideae* (Cass.) Dum. ibid. p. max. p.—Subtrib. *Hieracieae* (Cass.) Dum. op. cit. 62.—Trib. *Cichorieae*. c) *Hieracieae*, d) *Crepideae*, e) *Lapsaneae* and f) *Lactuceae* Dum. Analyse fam. pl. (1829) 30.—Trib. *Hieraceae* D. Don in Edinb. New Philos. Journ. VI (1829) 306.—Trib. *Lactuceae* D. Don op. cit. 307.—Subtrib. *Lapsaneae* Less. Synops. Compos. (1832) 126, p. min. p.; DC. l. c. (eodem ambitu).—Subtrib. *Hieracieae* Less. op. cit. 140; DC. op. cit. 198.—Gruppe *Chondrilleen* W.D. Koch, Taschenb. Deutsch. u. Schweiz. Fl. (1844) 314.—Gruppe *Lactuceen* W.D. Koch op. cit. 316.—Gruppe *Crepideen* W.D. Koch op. cit. 318.—Subtrib. *Lapsaneae* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 168, 220, p.p.—Subtrib. *Rhagadioleae* Benth. ibid. p. max. p.—Subtrib. *Crepideae* Benth. op. cit. 168, 221, p. max. p.—Subtrib. *Hieracieae* Benth. Ibid.—Subtrib. *Hypochoerideae* Benth. op. cit. 168, 222, p. min. p.—Subtrib. *Cichorinae* O. Hoffm. in Engl. u. Prantl. Nat. Pflanzenfam. IV, 5 (1893) 353, p. min. p.—Subtrib. *Crepidinae* O. Hoffm. op. cit. 366; Stebbins in Madroño XII, 3 (1953) 76.—Pappus usually of numerous, thin, mostly white, smooth or weakly barbed hairs (under lens!), sometimes unequal in length, more rarely also in thickness; in other cases pappus of outer tuft of short reduced hairs (under lens!) and inner normal hairs; very rarely pappus weakly

developed or entirely absent. Pollen grains usually spiny-cristate (echinolphate). Receptacle glabrous, smooth or somewhat tuberculate, alveolate or punctate; less often alveolate with hairs, ciliolate or fimbriate. Basic chromosome number: $x = 9, 8, 7, 6, 5, 4$ and 3 .

Type of subtribe: genus *Crepis* L.

Crepidinae is the largest subtribe of the Cichorieae. Several major lines are clearly distinguishable in its phylogenetic development.

1. **Launaea—Sonchus** Line (from the genus *Paramicrorhynchus* to the genus *Reichardia*). This mainly includes the African genera and species with pappus hairs not always similar in length and thickness. Plants usually of dry habitats.

236 2. **Hieracium** Line. Includes only two genera (*Hieracium* and *Andryala*). Achenes cylindrical and truncate. Pappus hairs mostly fragile, usually not pure white.

3. **Prenanthes—Lactuca** Line (from the genus *Prenanthes* to the genus *Lagoseriopsis*; however, the referral of the latter genus to this line is still not altogether justified). Pappus hairs numerous, more or less soft and white, rarely dirty white or rusty, denticulate (visible under hand lens!) to almost smooth, or pappus dimorphic: outer tuft of short reduced hairs (under hand lens!), inner normal hairs. The most primitive members of this line are mesophytic herbs, growing in forests in the subalpine zone of the temperate regions of Eurasia. Mostly quite leafy, often tall, herbaceous plants.

4. **Youngia—Ixeris** Line (from the genus *Youngia* to the genus *Acanthocephalus*). Mostly smooth or weakly pubescent plants; achenes usually tuberculate, especially at the apex. Pappus usually of barbed hairs, sometimes reduced or entirely absent.

5. **Crepis** Line (the genera *Crepis*, *Lagoseris* and *Zacyntha*). Plants usually pubescent, sometimes glabrous; hairs soft, sometimes stiff or setose. Pappus usually present (very rarely absent in marginal achenes), of scabrous-serrate or dentate, soft, generally white hairs. The central genus *Crepis* L. includes species distributed in the Old as well as the New World.

GENUS 1648. **Paramicrorhynchus** Kirp. Gen. Nov.^{1,2}

Kirp. in Addenda XXVIII, 725.

¹ Treatment by M.E. Kirpicznikov.

² From the Greek word *para*—near, and the generic name *Microrhynchus*.

Capitula homogamous, with 15–30 florets, usually cylindrical, solitary in groups of few capitula at apices of branches and in axils. Involucre (three-) four or five-rowed, imbricate; bracts scarious along margin. Achenes heteromorphic: outer achenes brown or gray, with rather numerous, prominent, longitudinal, tuberculate-rugose ribs, narrowed at base, deltoidly narrowed at apex, terminating into slender, scarcely visible, fragile beak; inner achenes prismatic-columnar, yellowish, with few (usually five) deep longitudinal furrows, somewhat membranous-rugose or smooth; intermediates between these two main types also found in each capitulum. Pappus of numerous thin, silky, white, somewhat barbed (under lens!) hairs, connate into a ring.

Type of genus: *Paramicrorhynchus procumbens* (Roxb.) Kirp.

- 237 **Note.** This species, referred by me to the new genus *Paramicrorhynchus*, is referred by the majority of contemporary taxonomists to *Launaea* Cass. and by some to *Microrhynchus* Less. The type species of *Launaea*—*L. bellidifolia* Cass.—grows on coastal sands of Madagascar. This plant is characterized by runner-like shoots and homomorphic achenes with five very prominent, semi-terete ribs. Our species cannot be retained in the genus *Launaea*, even if only because the achenes of the latter are homomorphic. Much more complex is the problem of the relationship of the species in question to *Microrhynchus* Less. This genus was established with a single species, *M. nudicaulis* (L.) Less. The basionym of the combination was *Chondrilla nudicaulis* L. Linnaeus in his original description stated: “Habitat in American septentrionali; ad pyramides aegypti.” There is every reason to believe that “North America” is indicated here by mistake (misprint?) instead of “North Africa.” Causing much greater difficulty is the fact that the original description, the literature, and the herbarium material do not yet allow us to determine precisely which particular plant under the name *C. nudicaulis* corresponds to the authentic specimen of Linnaeus. An annual plant figures in the works of some (mainly older) authors and collectors under the name: *C. nudicaulis*, whose achenes are appressed, with a short but distinct attenuation at the apex, and all the pappus hairs are similar in thickness. Among other authors and collectors *C. nudicaulis* is understood as a biennial or perennial plant with prismatic or columnar achenes, close to those of *Rhabdotheca* Cass.; the pappus hairs are of differing thickness, typical also of *Rhabdotheca*. It is difficult to infer from Lessing’s brief description which particular species of the two was taken by him as the basis of the genus *Microrhynchus*. It is even more problematic to determine which of them corresponds to the true *Chondrilla nudicaulis*. For this, it is essential to study the achenes of the authentic Linnaean specimen. One thing is clear: if *C. nudicaulis* is an annual plant with achenes and pappus, as referred to earlier, then the genus *Microrhynchus* has a right to

independent status (but this may threaten the status of the later established genus *Brachyrhamphus* DC.). If, however, the type species is the same plant as the type species of *Rhabdotheca*, then the genus *Microrhynchus* becomes redundant. In both cases, the species widely known as *Launaea* (*Microrhynchus*) *fallax* does not agree with the diagnosis of *Microrhynchus* in the nature of the achenes and should be split off into a new genus, which I have named *Paramicrorhynchus*. Morphologically it is close to *Lomatolepis* Cass.

1. **P. procumbens** (Roxb.) Kirp. comb. nova.—*Prenanthes procumbens* Roxb. Fl. Indica III (1832) 404.—*Microrhynchus fallax* Jaub. and Sp. Ill. pl. or. III (1847–1850) 106; O. and B. Fedtsch. Perech. Rast. Turk. IV, 347 (Consp. Fl. Turk. No. 2846); Vvedensky et al. Opred. Rast. Golodnoi Stepi 40 (Tr. Tashkent. Gos. Univ. Vyp. 178, Bot.); Kovalevskaja in Fl. Uzb. VI, 479.—*Zollikoferia leucodon* Fisch. and Mey. Ex Kar. in Bull. Soc. Nat. Mosc. XII, 2 (1839) 161, nomen (Enum. pl. in Turcom. et Pers. bor. leg. No. 526). —*Z. fallax* Boiss. Fl. or. III (1875) 824.—*Launaya fallax* Kuntze, Rev. Gen. I (1891) 350; Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 431 (Fl. of Afghanistan, 1960).—*Launaea fallax* Muschl. A. Man. fl. Egypt. II (1912) 1060; Nevski in Sorn. Rast. SSSR IV, 345; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 101; Kirp. in Fl. Turkm. VII, 332; Zakirov, Fl. i Rast. Bass. Zeravsh. II, 426.—*L. fallax* Jaub. and Sp. ex B. Fedtsch. Rast. Turk. (1915) 764.—*L. procumbens* Amin in Täckholm, Students fl. of Egypt (1956) 84 (nom. illegit., sine basionymo).—*Microrhynchus nudicaulis* auct. fl. Ross. pler. As. Med., non Less. (incl. β *divaricatus* DC.); Ldb. Fl. Ross. II, 2, 832; and B. Fedtsch. Perech. Rast. Turk. IV, 347 (Consp. Fl. Turk. No. 2845).—*Launaea nudicaulis* auct. fl. As. Med., non Hook. f.: B. Fedtsch. Rast. Turk., 764.—**lc.**: Jaub. and Sp. op. cit. t. 276; Kovalevskaja op. cit. Plate XLVI; Fig. 5 (utroque casu sub *Microrhyncho fallaci*).—**Exs.**: Sintenis, It. transcasp.-pers. 1900–1901, No. 2001 (sub *Zollikoferia fallaci*).

Perennial (or biennial?). Stems few, 10–30(50) cm high, ascending or procumbent, weakly pubescent or almost glabrous, weakly sulcate, slender (usually 1–1.5 mm thick), sometimes weakly geniculate, often leafless (virgate), almost dichotomously branched. Lower leaves in basal rosette, pinnatilobate, or pinnatisect, or runcinate, with white, cartilaginous, usually uncinat spinules along margin; cauline leaves few, small, almost entire to erose-toothed and pinnatisect. Capitula cylindrical (sometimes slightly broadened above or with slight constriction in middle), with 15–20(30) florets, solitary or in groups of few at apices of branches or on short peduncles in axils on main stem. Involucre (three-) four- or five-

rowed, imbricate; bracts with wide, light-colored, scarious border, with midrib, thickening in lower part; outer bracts very small, triangular-ovate; middle bracts gradually expanded; inner bracts oblong-linear. Corolla yellow. Achenes 2.3–2.8(3) mm long, heteromorphic; outer achenes dark brown or gray, with rather numerous, usually light-colored, prominent, longitudinal tuberculate-rugose ribs, truncate at base, deltoidly narrowed toward apex terminating in slender, light-colored, scarcely visible, fragile beak; inner achenes prismatic-columnar, usually stramineous, more or less not tuberculate-rugose; intermediates between these two forms also found; pappus about three times as long as achene, of numerous, very thin, silky white, slightly barbed (under lens!) hairs, basally connate into ring. Flowering (May) June to October. (Plate XV, Fig. 2.)

Floodplains of rivers and gravelly terraces, mostly on saline soils; in
 239 oases; sometimes in cotton fields, mulberry plantations and in orchards.
 —*Soviet Central Asia*: Kyzyl-Kum, Kara-Kum, mountainous Turkmenia, Amu-Darya, Syr-Darya, Pamiro-Alai. *General distribution*: western Mediterranean, eastern Mediterranean, Iran Region (Iran and Afghanistan), Indo-Himalayas, Dzhungaria-Kashgaria (Kashgaria).

Note. Given that *Microrhynchus nudicaulis* is excluded from the flora of the USSR, the present treatment does not include the many synonyms of this species cited in the works of Russian taxonomists. A complete list can be found in Ledebour (Ldb. op. cit.).

GENUS 1649. **Rhabdotheca** Cass.^{1,2}

Cass. in Dict. sc. nat. XLVIII (1827) 424.—*Microrhynchus* Less. §1. *Rhabdotheca* DC. Prodr. VII,1 (1838) 180; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 518.—*Sonchus* L. subgen. *Rhabdotheca* (Cass.) Jaub. and Sp. III pl. or. III (1847–1850) 110.—*Launaea* s. l. auct. p. min. p. (non Cass. in Dict. sc. nat. XXV (1822) 321): O. Hoffm. in Pflanzenfam. IV, 5 (1894) 370.—*Zollikoferia* DC. op. cit. p. 183, p. p. (non *Zollikoferia* Nees, 1825). —*Zollikoferia* DC. sect. I. *Euzollikoferia* Boiss: Fl. or. III- (1875) 822, p. max. p.

Capitula homogamous, usually with 15–35 flowers, borne singly at apices of branches, not drooping off at fruit maturity, cylindrical, turbinate, narrowly campanulate, or ovoid. Involucral bracts four- or five-rowed, imbricate. Receptacle flat or weakly convex, glabrous, with papilliform projections at point of attachment of ovary (always?). Anthers with

¹ Treatment by M.E. Kirpicznikov.

² From the Greek words *rhabdos*—rod, twig, and *thece*—storehouse; the name alludes to the rod-shaped fruits, containing the achenes in a sheath.

sagittate appressed appendages. Style in upper part and its branches (outside) densely covered with short and fine, upward-directed hairs. Achenes columnar (rod-shaped or narrowly cylindrical according to some authors), with four or five strongly developed longitudinal ribs, heteromorphic: outer (peripheral) achenes sometimes more or less curved, usually five-ribbed, densely pubescent (under lens!), usually grayish, dark gray, or dark brown; more or less glabrous toward center of capitulum and light colored, number of ribs often four, thus innermost achenes more or less glabrous, pale brown or stramineous; achene slightly broadened at base and with depressed bottom. Pappus persistent, of fewer relatively thick, long and erect hairs and more numerous, very soft, thin, silky, more or less flexuous hairs.

Type of genus: *Rhabdotheca chondrilloides* (Desf.) Webb. (= *Sonchus chondrilloides* Desf., *Rhabdotheca sonchoides* Cass., *Zollikoferia chondrilloides* DC.).

240 The genus includes 7–10 species, of which only one is known in the USSR, almost exclusively on the Ust-Urt Plateau and in the Turan lowland; most of the species are found in northern Africa (Morocco, Algeria, Libya, Egypt, Lebanon, Syria, Saudi Arabia), as well as in the Pyrenees (mainly in the southeastern part).

1. **R. korovinii** (M. Pop.) Kirp. in Fl. Turkm. VII (1960) 327; Kovalevskaja in Fl. Uzb. VI, 479.—*Zollikoferia korovinii* M. Pop. in Bot. Mat. Gerb. Glavn. Bot. Sada RSFSR V (1924) 37.—*Reichardia korovinii* M. Pop. ibid. in synonym.—*Launaea korovinii* M. Pop. ex pavl. Fl. Tsent. Kazakhst. III (1938) 360; Zakirov, Fl. i Rast. Bass. Zeravsh. II, 426—Ic.: Kirp. op. cit. 329; Plate LI; Kovalevskaja, op. cit. Plate XLV, Fig. 1.

Annual? Roots slender, simple. Stems 5(12)–25(40) cm high, very finely tomentose (sometimes mixed with isolated straight hairs) or almost glabrous, usually divaricately branched or divaricately forked from middle, only rarely weakly branched (in small plants); branches strong; terminal branches with very fine scale leaves, bearing solitary capitula at apices. Leaves somewhat thick, usually lanceolate, gradually strongly reduced upward, erose-sinuate to deeply pinnatisect, with whitish, dense, cartilaginous spinules or spinescent teeth along margin; basal leaves basally wide, petiolate, often crowded in rosettes; cauline leaves sessile, semiamplexicaul, auriculate. Capitula more or less cylindrical or narrowly ovoid to conical, with 15–20(35) florets. Involucral bracts usually decurved after fruiting, finely pubescent outside, sometimes violet; outermost bracts small, obovate, auriculate, usually abruptly narrowed into subobtuse more or less recurved cusp; middle bracts oblong-linear, with similar apex; innermost bracts oblong-linear, several times as long as outermost, subobtuse or obtuse, with wide scarious border. Corolla yellow(?). Achenes

about 10 mm long and up to 1 mm wide, columnar (narrowly cylindrical), with more or less deep, four or five, longitudinal furrows, slightly narrowed above, weakly expanded below, with distinctly depressed hilum continued inward, and few radial septae convergent at center; outer achenes covered with very short, upward-directed, membranous appendages or papillose
 241 hairs (under a hand lens!), forming transverse undulate rows on achenes; inner achenes subglabrous or glabrous; pappus persistent, slightly shorter than achenes, of white heteromorphic hairs; in inner achenes five to nine, thicker, long, dense, slightly (especially at apex) barbed (under a hand lens!); in outer achenes more numerous and shorter, silky, very thin, soft, more or less flexuous, almost completely smooth. Flowering May to July. (Plate XV, Fig. 3.)

On low hummocky or gravelly sands in desert, less often on small clay hills. *Soviet Central Asia*: Aralo-Caspian, Kyzyl-Kum, Kara-Kum, mountainous Turkmenia, Amu-Darya, Syr-Darya (former Kokand District). Endemic. Described from Turkmenia and Uzbekistan.

As a lectotype, I propose to select the followig specimen, preserved in the V.L. Komarov Botanical Institute, Academy of Sciences of the USSR, Leningrad: "Fergana Region, Kokand District, sands near Kyzyl-Tol, southeast of village Dauduk, 23. VI. 1913, No. 882, Z.A. Minkwitz." The specimen has an additional label in the hand of M.G. Popov: "*Launaea korovinii* M. Pop. (sp. n.)."

GENUS 1650. *Atalanthus* D. Don^{1,2}

D. Don in Edinb. New Phil. Journ. VI (1829) 311; Pomel, Nouv. mat. fl. Atl. fasc. I (1874) 7, p. min. p.—*Sonchus* L. sect. III. *Atalanthus* DC. Prodr. VII, 1 (1838) 189, p. p.—*Sonchus* L. subgen. II. *Acanthosonchus* Sch. Bip. in Parker-Webb. and Berth. Hist. nat. il. Canar. III, p. II, sect. 2 (1850) 427.

Capitula homogamous, with 5–12 florets, usually cylindrical, solitary or, less often, in groups of two to a few, at apices or in axils of short spinose branches. Involucre three- to five-rowed, imbricate; bracts usually squarrose, innermost linear, oblong-linear, or elliptical, scarious along margin. Achenes heteromorphic: prismatic and almost not compressed, oblong, fusiform, or elliptical and more or less compressed with few (usually four) prominent ribs, or ribs many, not so prominent. Pappus of numerous, thin, white, silky, weakly barbed (under lens!) somewhat unequal hairs.

¹ Treatment by M.E. Kirpicznikov.

² From the Greek words, *atalos*—tender, and *anthos*—flower.

Lectotype of genus: *Atalanthus spinosus* (Forsk.) Pomel.

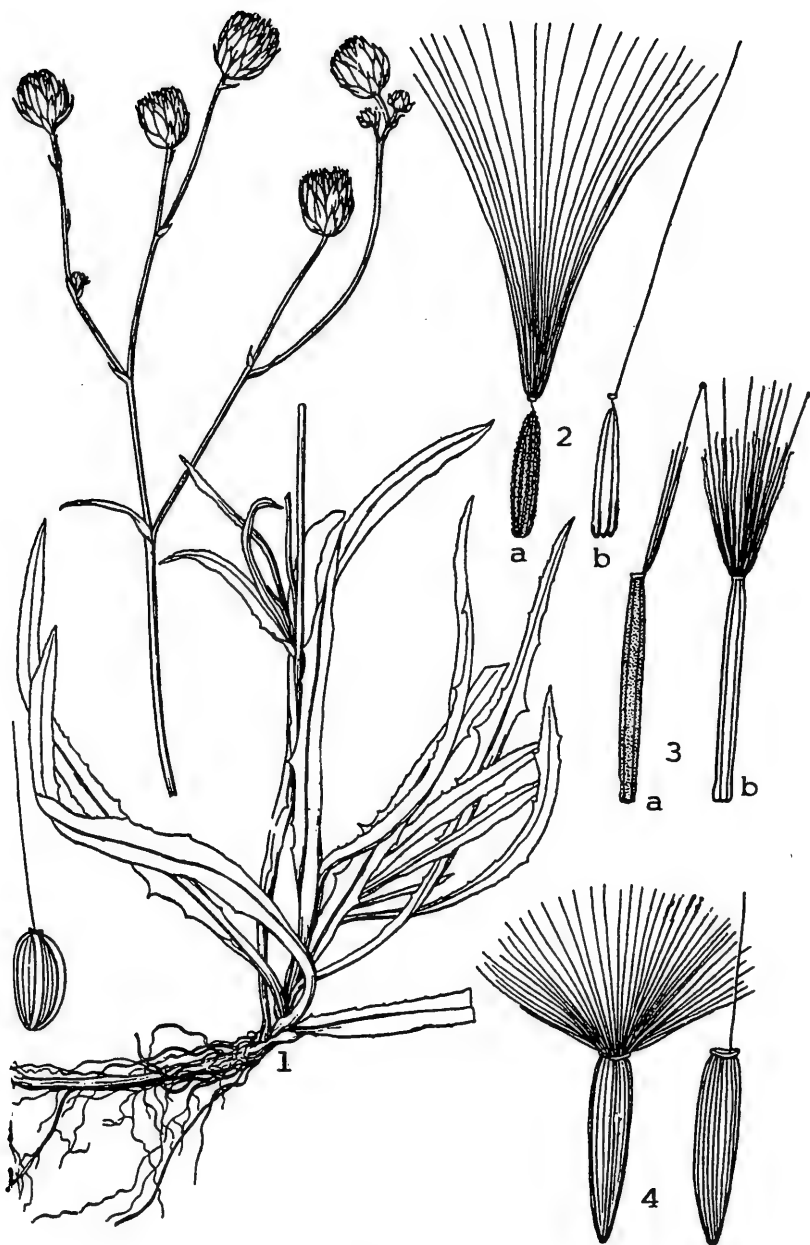
Divicately branched semishrubs or shrubs; branches usually spinose. The genus comprises few species, mainly found in arid areas of the Mediterranean Region, on the Canary Islands, in Iran, Afghanistan, Mongolia, northern China; Turkmenian SSR in the USSR.

1. **A. acanthodes** (Boiss.) Kirp. comb. nova.—*Zollikoferia acanthodes* Boiss. Fl. or. III (1875) 827; O. and B. Fedtsch. Perech. Rast. Turk. IV, 347 (Consp. Fl. Turk. No. 2847).—*Launaya acanthodes* Kuntze, Rev. Gen. I (1891) 350.—*Launaea acanthodes* T. Durand and B.D. Jackson in 242 Ind. Kew. Suppl. I, fasc. 3 (1903) 240. *L. acanthodes* Boiss. ex B. Fedtsch. Rast. Turk. (1915) 763.—*L. acanthodes* B.D. Jackson ex Kirp. in Fl. Turkm. VII (1960) 324.—**IC.**: Kirp. op. cit. 325, t. L (sub. *Launaea acanthode*).

Perennial or cultivated. Stem 30–50 cm high, shallowly sulcate, glaucescent, very finely tomentose or glabrous, up to 5 mm thick at base, gradually becoming thinner above, often forked, with terminal, stiff, spinescent branches. Leaves withering early (as a result, stems of fertile plants usually leafless, virgate), stiff, glaucous, elliptical, oblong or oblong-spatulate, narrowed into wide petiole, erose-sinuate, with sparse, thick, cartilaginous spines. Capitula cylindrical or narrowly obconical, with 5–6(10) florets, solitary, less often two to several, on branches (often in their axils) on short peduncles with finely pubescent, scaly leaves, somewhat gradually merging with outer involucre bracts. Involucre (three-) four- or five-rowed, loosely pubescent on dorsal side, weakly divergent; outer bracts shorter, triangular or widely ovate, inner ones longer, elliptical or oblong-lanceolate, with wide transparent border. Corolla yellow. Achenes about 4 mm long, heteromorphic, some prismatic or more or less fusiform, glabrous or weakly pubescent, with few (often four) ribs at corners, obtusely truncate at base; others more or less asymmetric, puberulent (strongly enlarged!), with many longitudinal ribs, usually narrowed below; besides these, intermediates of achenes also found, with truncate apex forming almost squarish wide areole-bearing pappus of numerous thin, white, silky, weakly barbed (under a hand lens!), about 3 mm long hairs. Flowering April to June. (Plate XV, Fig. 4.)

Stony, gravelly and rubbly soils in deserts and foothills.—*Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Iran. Described from Iran. Type in Geneva.

Note. A quite polymorphic and inadequately studied species. Collections of specimens with indisputably mature achenes, as well as good specimens from which to derive more accurate information about the vegetative plant parts (especially about the root system and leaves), are desired.



1.—*Sonchus transcaspicus* Nevski, habit and achene; 2.—*Paramicrorhynchus procumbens* (Roxb.) Kirp.: a—outer achene, b—inner achene; 3.—*Rhabdotheca korovinii* (M. Pop.) Kirp.: a—outer achene, b—inner achene; 4.—*Atalanthus acathodes* (Boiss.) Kirp., achenes.

L. Sp. pl. (1753) 793; DC. Prodr. VII, 1 (1838) 184, p. p.; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 528, p. p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 371, p. p.; Boulos in Bot. Notis. CXIII, 4 (1960) 400.

Capitula homogamous, many-flowered (each with 75–250 florets) or, less often, few-flowered, in corymbose, corymbose-paniculate, or umbellate-corymbose inflorescence. Involucre obovoid, campanulate, bowl-shaped or cylindrical, often swollen below after flowering and then pitcher-shaped, two- or three- (four)-rowed, imbricate; involucre bracts herbaceous, lanceolate, oblong or narrow-triangular, usually scarious along margin; inner bracts two times or more as long as outermost. Receptacle flat. Anthers with short sagittate basal appendage. Corolla yellow. Achenes ovoid, oblong, oblong-ovoid or obovoid, flattened to flat, less often prismatic, with several (up to 20) longitudinal ribs, often transversely rugose. Pappus of numerous white, fragile hairs falling singly or more or less distinctly clustered in groups of few, or pappus hairs basally connate into ring easily detaching from achenes.

Lectotype of genus: *Sonchus oleraceus* L.

The genus is represented by annual, biennial, or perennial, mainly herbaceous plants, growing in the wild in Eurasia and Africa; several weedy species have been dispersed by man over almost the whole world. The genus, in a broader sense, comprises about 50 species.

1. Perennials 2.
- + Annuals (sometimes biennial?) 5.
2. Plants with vertical root and more or less horizontal long, cord-like, rhizomatous. fragile lateral roots, bearing numerous adventitious buds. Achenes dark brown. Widespread weeds 4. *S. arvensis* L.
- + Plants with rhizomes. Achenes light-colored 3.
3. Leaves usually 0.6–1.5 cm wide and 8–15 cm long, linear, lanceolate or oblong-lanceolate, undivided or, sometimes, sinuate, glaucous or glaucous-green. Species found in Southern Transcaucasia and Soviet Central Asia 1. *S. transcaspicus* Nevski

¹ Treatment by M.E. Kirpicznikov.

² The name is found in the works of ancient authors: Theophrastus used it to designate some thistle-like plant, while Pliny, in all probability, used it for the present *Sonchus oleraceus* L.

- 245 + Leaves wider, at least some of them more or less strongly divided 4.
4. Robust, herbaceous, usually 80–200 cm-high plants, with numerous long, glandular hairs in upper part and on peduncles 2. *S. palustris* L.
- + Less robust plants, usually 50–70 cm high, without glandular-hairy peduncles and involucre bracts 3. *S. sosnowskyi* Schchian
- 5(1) Achenes almost always with only three filiform longitudinal ribs on each side, smooth and not transversely rugose between them, or weakly rugose, or edges of achenes usually winged and barbed (under lens!) 6. *S. asper* (L.) Hill
- + Achenes with three or more strongly projecting longitudinal ribs on each side, distinctly transversely rugose, not winged 5. *S. oleraceus* L.

Section 1. *Sonchus*.—*Sonchus* sect. II. *Sonchi genuini* W.D. Koch, Synops Fl. Germ. et Helvet. (1837) 433.—*Sonchus* sect. *Eusonchus* DC. Prodr. VII, 1 (1838) 184.—*Sonchus* subgen. *Sonchus*: cfr. Boulos in Bot. Notis. CXIII, 4 (1960) 412.—Capitula many-flowered; achenes without beak, usually truncate at apex. Mostly polymorphic plants with alternate leaves sometimes crowded in basal part of stem, usually distinctly divided, mostly echinate-toothed along margin.

Type of section: type of genus.

Series 1. *Maritimi* Kirp.—Achenes stramineous or light-brown, more or less distinctly three- or four-angled, with few prominent ribs on each side, middle rib usually thicker than others. Plants often growing on saline soils along seacoasts as well as in arid, usually sandy habitats near water sources (rivers, canals, etc.). The series is named after *S. maritimus* L., which is not found in the USSR.

1. *S. transcaspicus* Nevski in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4 (1937) 293; in Sornye Rast. SSSR IV (1935) 336, descr. ross.; Schchian in Zam. po Sist. i Geogr. Rast. Tbil. 15, 66, Kirp. in Fl. Turkm. VII, 332; Askerova in Fl. Azerb. VIII, 548; Kovalevskaja in Fl. Uzb. VI, 482.—*S. maritimus* auct. non L.: Boiss. Fl. or. III, 797; Rech. f. in Dan. Biol. Skr. VIII, 2, 202 (Symb. Afghanicae II); Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 448 (Fl. of Afghanistan, 1960).—*S. baburi* M. Pop. in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14 (1941) 106 (descr. ross.).—*S. arvensis* auct. non L.: Grigorev, Opred. Rast. Okr. (Dushanbe), 288.—**lc.**: Kovalevskaja, op. cit. Plate XLVII, 246 Fig. 4.—**Exs.**: Kotschy, Pl. Pers. austr. 1845, No. 109; Bornm. It. pers.-

turc. 1892–1893, No. 4112; Sintenis, It. transcasp.-pers. 1900–1901, Nos. 276, 1648 (omnia sub *S. maritimo* L.).

Perennial. Plants with creeping rhizomes; stems (6)25–50(80) cm high, weakly sulcate, smooth or arachnoid-tomentose above (especially below capitula). Leaves glaucous or glaucous-green, narrowly linear, linear, lanceolate or oblong-lanceolate, (2)8–15(22) cm long and (0.2)0.6–1.5(3) cm wide, undivided or, less often, more or less sinuate, with short inconspicuous spinules along margin; lower cauline leaves narrowed toward base into narrowly winged, semiamplexicaul petiole; upper leaves sessile, with auriculate or sagittate base. Capitula two to five (sometimes more), on long peduncles, with about 100 florets, aggregated in lax corymbose inflorescence. Involucre campanulate or bowl-shaped, 8–12 mm long, (7)10–15(20) mm wide, two- or three-rowed, basally pubescent; outer involucre bracts lanceolate or narrowly triangular, inner bracts oblong-lanceolate, with membranous border, acute or subobtusate, sometimes with tuft of hyaline hairs (under lens!). Corolla yellow or pale yellow. Achenes ovoid, oblong or (less often) oblong-ovoid, (2)2.5–3 mm long and 1–1.25 mm wide, usually straw-yellow, more or less distinctly three- or four-angled or flattened, with several (often five) prominent longitudinal ribs on each side; central achenes often thicker than others, with short, annular, reddish-brown ridge at apex; pappus of thin, soft, usually absolutely smooth, readily detached hairs, about two times as long as achene. Flowering June to September. (Plate XV, Fig. 1.)

Foothills up to middle mountain zone; in wet places in river valleys and along streams.—*Caucasus*: Southern Transcaucasia; *Soviet Central Asia*: mountainous Turkmenia, Amu-Darya, Syr-Darya, Pamiro-Alai. *General distribution*: eastern Mediterranean, ?Armenia and Kurdistan, Iran Region (Iran and Afghanistan), Indo-Himalayas (Pakistan; published report). Described from Soviet Central Asia (Kugitang). Type in Leningrad.

Note. Very close to the Mediterranean species *S. maritimus*, L., but differs from it by having glaucous, less serrate, almost entire leaves and smaller capitula.

Some authors (cf. Zakirov, *Fl. i. Rast. Bass. Zeravsh.* II (1961) p. 427) include *S. transcaspicus* in the synonyms of *S. maritimus* α *angustifolius* Bisch. (*Beitr. z. Fl. Deutschl., Cichorieen* (1851) 225). In fact, this variety was established for European specimens having no relationship to the Mediterranean material.

Series 2. Palustres Schchian in Zam. po Sist. i Geogr. Rast. Tbilisi 15 (1949) 63, p. p.—Achenes light-yellow or brownish, more or less distinctly tetrahedral, weakly rugose transversely. Plants of marshy and moist places.

- 247 2. **S. palustris** L. Sp. pl. (1753) 793 ("*paluster*" auct mult.); DC. Prodr. VII, 1, 187; Ldb. Fl. Ross. II, 2, 836; Boiss. Fl. or. III, 798; Schmalh. Fl. II, 164; Fedtsch. and Fler. Fl. Evrop. Ross. 1056; O. and B. Fedtsch. Perech. Rast. Turk. IV, 348 (Consp. Fl. Turk. No. 2851); Grossh. Fl. Kavk. IV (1934) 254 and Opred. Rast. Kavk. 515; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 184; Krasch. in Fl. Yugo-Vost. VI, 467; Pavlov, Fl. Tsent. Kazakhst. III, 363; Kryl. Fl. Zap. Sib. XI, 3020; Klok. in Vizn. Rosl. URSR, 602; Schchian in Fl. Gruzii VIII, 677; Szafer, Kulcz., B. Pawl. Rośl. Polskie (1953) 742; Kirp. in Majevski, Fl. (1954) 632; Hayek in Hegi, Ill. Fl. 2, Aufl. VI, 2, 1102; Dostál, Klíč (1954) 804; Stank. and Tal. Opred. Vyssh. Rast. (1957) 441; Mikhailovskaja in Fl. BSSR, V, 190; Kirp in Fl.-Turkm. VII, 332; Nikitina, Mater. po. Fl. Sev. Ski. Kirg. Ala-too, 111, No. 1132; Askerova in Fl. Azerb. VIII, 548; Kovalevskaja in Fl. Uzb. VI, 482. *S. sexpedalis* Gilib. Fl. Lithuan. III (1781) 241; Ej. Exerc. phytol. I (1792) 192.—*S. paludosus* Gueldenst. ex Ldb. Fl. Ross. II, 2 (1845–1846) 836.—*S. inundatus*. M. Pop. in Tr. Uzb. Gos. Univ., Nov. Sdr. No. 27, Bioi. Vyp. 14 (1941) 105 (descr. ross.); Zakirov, Fl. i Rastit. Bass. Zeravsh. II, 427.—**!c.**: Rchb. f.-!c. fl. Germ. et Helvet, XIX (1859), t. 63 (MCCCCXIV); Syreistsch. Ill. Fl. Mosk. Gub. III (1910) 335; Javorka and Csapody, Iconogr. fl. Hungar. (1933) t. 559, fig. 4019; Hegi, op. cit. 1102, fig. 782; Dostál, op. cit. 805, fig. 2225; Stank. and Tal. op. cit. 442, Fig. 413.—**Exs.**: Rchb. Fl. Germ. exs. No. 1666; Fl. Gall. et Germ. exs. No. 889; Billot, Fl. Gall. et Germ. exs. No. 3429; Sintenis, It. transcasp.-pers. 1900–1901, No. 954.

Perennial. Rhizome short, thick (up to 4–5 cm), producing string-like roots, Stems (30)80–200 cm high (according to published reports up to 425 cm), at base 1.5–3 cm thick, fistular, hard, sulcate, glabrous below, with numerous long glandular hairs above, including peduncles (only very rarely more or less glabrous). Leaves sessile, sagittate at base, spinose-toothed along margin; lower leaves large (15–35 cm long and 5–20 cm wide), pinnatipartite or runcinate, with few lateral triangular lobes and large (attenuate) apical triangular or lanceolate lobe; middle cauline leaves shorter than lower, lanceolate long-acuminate, undivided, spinulose-toothed or almost entire, uppermost leaves linear-lanceolate or linear, small, entire. Flowering shoots hard, usually long, slightly thickened below, bearing more or less large number of compact peduncles of variable length, usually umbellate. Capitula in corymbose or corymbose-paniculate inflorescence, numerous, each well-developed capitulum comprising about 75 florets. Involucre narrowly or broadly campanulate, 10–15 mm long; involucre bracts two- or three-rowed, dirty-dark green, lanceolate, densely covered on outer side (like peduncles and flowering shoots) with long glandular hairs. Corolla yellow. Achenes light yellow or brownish, 4–5 mm long and about 1 mm wide, almost tetrahedral (prismatic), slightly compressed,

weakly finely-rugose transversely, with four relatively thick lateral ribs and two or three not so distinct longitudinal ribs between them; achenes apically truncate with flat, level, quadrangular or roundish-rectangular disk with weakly raised (under high magnification!) reddish margins, slightly narrowed toward base; pappus of white or sometimes yellowish-white, very thin, soft, somewhat barbed (under high magnification!) rather fragile bristles, about two times as long as achene. Flowering May to September. (Plate XVI, Fig. 2.)

Wet marshy places, riverbanks, in swamps among shrubs; in the zone of irrigated agriculture—along streams and impoundments.—*European Part*: (everywhere quite rare): Dvina-Pechora (southwest; only, one sheet seen from vicinity of Vologda), Baltic Region (published reports), Upper Volga, Volga-Kama (southern half), Upper Dnieper, Middle Dnieper, Volga-Don, Trans-Volga, ?Upper Dniester, Bessarabia (published reports), Black Sea Region, Crimea (one sheet seen from southern slope of Chatyr-Dag), Lower Don, Lower Volga; *Caucasus*: all regions (but rare); *Western Siberia*: all regions (but everywhere very rare); *Soviet Central Asia*: Aralo-Caspian, Balkhash, Dzhungaria-Tarbagatai, mountainous Turkmenia, Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: Scandinavia, central Europe, Atlantic Europe, western Mediterranean, Balkans-Asia Minor (Balkan Peninsula), Dzhungaria-Kashgaria. Described from Europe. Type in London.

Note. *S. palustris*, unlike other common and widespread *Sonchus* species, is not a weed, and probably, therefore, it is relatively less polymorphic.

3. *S. sosnowskyi* Schchian in Zam. po Sist. i Geogr. Rast. Tbil. 15 (1949) 72. **lc.**: Schchian, op. cit. t. post pag. 74, fig. 7 (solum achenium).

Perennial. Stem 50–70 cm high, glabrous, sulcate, Leaves glabrous, glaucous-green, sinuate-runcinate, with fairly large, wide triangular, apically attenuate terminal lobe and smaller, retrorse lateral lobes, spinose-toothed, along margin, and with acute auricles at base. Capitula on smooth peduncles, medium, up to 2 cm wide, in lax, divaricate-corymbose inflorescence. Involucral bracts smooth; outer bracts linear-lanceolate, shorter than inner, lanceolate bracts, apically brownish. Achenes brownish, oblong-ovoid, weakly tetrahedral, with thin, almost acute edges and inconspicuous ribs in between, indistinctly rugose transversely or almost smooth. Flowering July. (Plate XVI, Fig. 5.)

In wet places.—*Caucasus*: Southern Transcaucasia. Endemic. Described from the collection of A. Schelkovnik and E. Kara-Murza from 249 the Gyunei bank of Lake Sevan. Type in Tbilisi.

Note. The description is taken from A. Schchian, as I saw only the one, albeit type specimen, a poor example, without the stem base and

roots, and having hardly any capitula. This species needs greater attention; it is necessary to confirm its separate status with new material.

Series 3. Arvenses Schchian in Zam. po Sist. i. Geogr. Rast. Tbilisi, 15 (1949) 63.—Achenes light brown or dark brown, usually with five transversely rugose ribs on each side. Primarily a weed, widely dispersed by man.

4. *L. arvensis* L. Sp. pl. (1753) 793; DC. Prodr. VII, 1, 187; Ldb. Fl. Ross. II, 2, 835; Schmalh. Fl. II, 163; Kom. in Tr. Peterb. Bot. Sada, XXV, 775 (Fl. Man'ch. III, No. 1644); Fedtsch. and Fler. Fl. Evrop. Ross. 1056; O. and B. Fedtsch. Perech. Rast. Turk. IV, 346; Kom. and Alis. Opred. Rast. Dalnevost. Kr. II 1097; Grossh. Fl. Kavk. IV (1934) 254 and Opred. Rast. Kavk. 515; Nevski in Sorn. Rast. SSSR IV, 334; Krasch. in Fl. Yugo-Vost. VI (1936) 467 (incl. f. *wolgensis* Krasch. ibid.); Perf. Fl. Sev. Kr. II–III, 375; Leskov. Fl. Malozem. Tundry, 103 (Tr. Sev. Bazy Akad. Nauk SSSR, Vyp. 2); Govorukhin, Fl. Urala 522; Pavlov, Fl. Tsentr. Kazakhst. III, 363; Sugaw. Ill. fl. Saghal. IV, 1923; Kryl Fl. Zap. Sib. XI, 3018; Popov, Ocherk. Rast. i Fl. Karpat, 256; Klok. in Vozn. Rosl. URSS 602; Cronquist in Gleason, New Britt. a. Br. III. fl. N. Un. St. a. adjac. Canada, 3, 534; Szafer, Kulcz., B. Pawl. Rośl. Polskie (1953) 742; Kirp. in Majewski, Fl. (1954) 631; Hayek in Hegi, Ill. Fl. Aufl. VI, 2, 1105; Dostál, Klíč (1954) 804; Grubov, Konsp. Fl. MNR 282, No. 1853 (Tr. Mong. Kom. Vyp. 67); Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1, 147 (Compos. Jap. V); Vorobev in Tr. Dalnevost. Fil., Ser. Bot. III (V), 78 (Material from Fl. Kuril'skikh Ostrovov, No. 992); Stank. and Tal. Opred. Vyssh. Rast. (1957) 441; Mikhailovskaja in Fl. BSSR V, 188; Popov, Fl. Sr. Sib. II, 787; Askerova in Fl. Azerb. VIII, 547.—*Hieracium arvense* Scop. Fl. carniol. ed. 2, II (1772) 110.—*Sonchus hispidus* Gilib. Fl. Lithuan. III (1781) 241; Ej. Exerc. phytol. I (1792) 193.—*S. arvensis* L. β . *integrifolius* Bisch. Beitr. z. Fl. Deutschl., Cichorieen (1851) 228.—*S. arvensis* L. γ . *hastatus* Kauffm. Moskovsk. Fl. (1866) 292.—**lc.**: Rchb. f. *lc.*: fl. Germ. et Helvet. XIX (1859), t. 61 (MCCCCXII), fig. 1–3; Fedtsch. and Fler. op. cit. 1056, Fig. 1071 (mediocr.); Javorka and Csapody, Iconogr. Fl. Hungar. (1933), t. 560, fig. 4020; Nevski, op. cit. 335, Fig. 490 (bona); Perf. op. cit. 377, Fig. 111; Krasch op. cit. 469, Fig. 721 (bona); Sugaw. op. cit. 1922, t. 885; Cronquist in Gleason, op. cit. 534; Hegi, op. cit. 1105, fig. 785 (bona) and 786–787 (ic. phot.) Dostál, op. cit. 805, fig. 2226; Mikhailovskaja, op. cit. 189, Plate LXIV (mediocr.).—**Exs.** Billot, Fl. Gall. et Germ. exs. No. 1256; Herb. Fl. Ingr. No. 365 and 365b; Fellman, Pl. Arct. No. 144 (f. *maritima*); Callier, Fl. Siles. exs. No. 851; Martianow, 250 Pl. Minusinensis exs. Nos. 382, 616; Degen, Pl. Hung. exs. (sine numero);

Fiori and Bég. Fl. Ital. exs., ser. II No. 1595; Pl. Finl. exs. Nos. 999, 1411.

Perennial. Plants with up to 50 cm long vertical root and more or less horizontal, long (up to 150 cm), string-like, tuberous, fragile, lateral roots, covered with numerous adventitious buds. Stems (6)40–100(150) cm high, erect, finely sulcate, including peduncles glandular-hairy or glabrous above. Leaves lanceolate or oblong, 8–20(28) cm long and 1.5–8(10) cm wide, somewhat stiff, almost undivided or weakly sinuate to pinnatilobate, pinnatisect and runcinate, more or less distinctly sharply spinose-toothed; lower leaves narrowed toward base into winged petiole, middle and upper leaves sessile, amplexicaul, basally auriculate or hastate. Capitula of 100–200 florets, usually few (5–10, very rarely more), in corymbose-paniculate or umbellate-corymbose inflorescence; peduncles glandular-hairy or glabrous, usually much longer than capitula. Involucre cylindrical or campanulate, 12–20 mm long, 7–15(25) mm wide; bracts lanceolate or oblong, dark green or blackish, two- or three (four)-rowed, often dorsally glandular-hairy. Corolla bright or golden yellow. Achenes oblong or ovoid, more or less distinctly compressed, dark brown, 2.5–3.5(5) mm long and 0.7–1 mm wide, usually with five transversely rugose ribs on each side, apically with low (inconspicuous) circular ridge, somewhat narrowed toward base; pappus of numerous, thin, soft, white or slightly grayish, more or less basally distinctly connate hairs, 9–13 mm long. Flowering June to October. (Plate XVI, Fig. 6.)

In crops, especially spring crops, lowlands and weedy places, kitchen gardens, roadsides, embankments of canals and peat quarries; meadows, steppefied areas with more or less strongly saline soil, riverbanks and seacoasts, shrub thickets (but usually in places where natural vegetation is destroyed for some reason).—*Arctic*: Arctic Europe; *European Part*: all regions; *Caucasus*: Ciscaucasia, Dagestan, Western Transcaucasia (reports about other regions doubtful); *Western Siberia*: all regions; *Eastern Siberia*: all regions; *Far East*: Zeya-Bureya, Uda area, Ussuri, Sakhalin; *Soviet Central Asia*: Aralo-Caspian, Balkhash, Dzhungaria-Tarbagatai, Kyzyl-Kum, ?Kara-Kum, Syr-Darya (rare), Tien Shan. *General distribution*: Almost throughout the world (excluding South Africa and South America). Described from Europe. Type in London.

Note. An extremely polymorphic species. There exist many attempts to reflect its plasticity through infra-specific taxa. Among such classifications, based mainly on the European material, I may mention only two, published, indeed, in the 20th century. One of them is Rouy's (*Flore de France*, IX (1905) 204). He illegitimately proposed the new
 251 species *S. vulgaris* Rouy and included, as two subspecies, *S. arvensis* L. and *S. maritimus* L., and for *S. arvensis* he described four varieties and one subvariety (designated by Greek letters). A somewhat simpler, but

still complex, infraspecific classification of *S. arvensis* was published by Hayek in Hegi (Hegi, op. cit. p. 1106).

Naturally, *S. arvensis* cannot be expected to be homogenous over the large area which it occupies in the USSR. But the specimens examined do not permit us to distinguish morphologically and geographically well-defined races. On the basis of the present study of the indigenous material of *S. arvensis*, it is sufficient to differentiate the following forms within the USSR.

1. *S. arvensis* f. *arvensis*. — *S. arvensis*. α. *pedunculis calycibusque hispidis* Weinm. Elenchus plant. (1824) 361. — *S. arvensis* α. *genuinus* Lindem. in Bull. Soc. Nat. Mosc. XLV, I, 2 (1872) 304. — *S. arvensis*. α. *involucris pedunculisque glanduloso-pilosis* Gruner in Tr. Obshch. Ispyt. Prir. Khar'k. Univ. VII (1873) 37. — *S. arvensis* f. *typicus* G. Beck, Fl. Nied. Oesterr. II, 2 (1893) 1322. — *S. arvensis* var. *typicus* Korsh. in Mém. Acad. Sc. Pétersb. VIII sér. VII, 1 (1898) 263 (Tentam. fl. Ross. or. No. 774). — *S. arvensis* α. *vulgaris* Kryl. Fl. Alt. III (1904) 747. — Involucral bracts, and often also peduncles, glandular-hairy.

This form is found only in the European, part of the USSR, in the south up to Crimea and Ciscaucasia. However, on occasion, it is also found in the Caucasus, western Siberia and elsewhere and outside the USSR in all European countries, North America, and so on. It is usually replaced by the next form in the Far North, especially along the seacoast.

2. *S. arvensis* f. *maritimus* (Wahl.) Rupr. in Mat. k. Blizh. Pozn. Prozyab. Ross. Imp. II (1845) 45 (Fl. Samoied. Cisuralens. No. 180). — *S. arvensis* β. *maritimus* Wahl. Fl. Suec. II (1826) 483. — *S. arvensis* β. *maritimus* Weinm. Enum. stirp. (1837) 75. — *S. maritimus* auct. non L.: Ldb. Fl. Ross. II, 2, 835.

Leaves narrow, oblong-lanceolate, almost undivided or weakly sinuate, finely toothed. Capitula solitary or few, usually large. Involucral bracts dirty dark green to blackish, as also the peduncles, without glandular hairs.

Mainly found on transported marine sands. A common plant in the north of the European part of the USSR (White Sea Coasts of the Kola Peninsula, Kanin Peninsula, coastal belt of Timan tundra, etc.). Specimens from Sakhalin belong to this form.

3. *S. arvensis* f. *glabrescens* (Guenth., Grab. and Wimm.) Kirp. stat. nov. — *S. arvensis* β. *glabrescens* Guenth., Grab. and Wimm. Enum. stirp. phanerog. Siles. (1824) 127. — *S. uliginosus* M.B. Fl. taur.-cauc. II (1808) 238 and III (1819) 525; Ldb. Fl. Ross. II, 2, 834; Pavlov, Fl. Tsent. 252 Kazakhst. III, 364; Schchian in Fl. Gruzii VIII, 676; Cronquist in Gleason, ibid. — *S. glaber* Schult. Observ. bot. (1809) 162. — ? *S. intermedius*

Bruckn. in *Script. naturf. Freunde Berlin* (1813) 153 (non vidi!).—*S. arvensis* β . *pedunculis calycibusque glabris* Weinm. *Elenchus plant.* (1824) 361. *S. arvensis* β . *laevipes* W.D. Koch, *Synops. fl. Germ. et Helvet.*, ed. 2 (1844) 498.—*S. arvensis* var. *uliginosa* Trautv. in *Bull. Soc. Nat. Mosc.* XXXIX, I, 2 (1866) 388.—*S. arvensis* β . *laevipes* Boiss. *Fl. or. III* (1875) 798.—*S. arvensis* var. *uliginosus* Korsh. *ibid.* —*S. arvensis* β . *uliginosus*, Kryl. *ibid.*—*S. arvensis* var. β . *glaber* Schult. *auct. mult. fl. Ross.*—*S. ketzkhovellii* Schchian in *Zam. po Sist. i Geogr. Rast. Tbil.* 15 (1949) 71; eadem in *F1. Gruzii VIII*, 676 (cum t. 438).

Involucral bracts and peduncles without glandular hairs.

The most widespread form of *S. arvensis* occurring especially frequently from the center of the European part of the USSR and extending to the south (Crimea, Caucasus) and the east (Siberia, Soviet Central Asia, Far East). It is difficult to assign it species rank, as at least in Siberia and Soviet Central Asia, f. *arvensis* is often found growing together with f. *glabrescens*. A. Schchian (*Zam. po Sist. i Geogr. Rast. Tbilisi* 15, 1949) holds a different opinion. He suggests that f. *glabrescens* should be considered a separate species: *S. uliginosus* M.B. According to him, this species is confined to the main steppe plains of Ciscaucasia, has a "definite geography," and in the Caucasus, it is vicarious in relation to *S. arvensis*. But in fact, the geographic integrity of this taxon is not very well expressed. In our opinion, we have before us a typical ecological form. Boulos (L. Boulos in *Bot. Notis. CXIV* (1961) 57–64), who worked on the cytotaxonomy of the genus *Sonchus*, also considers *S. uliginosus* a synonym of *S. arvensis*.

Based on his assumption regarding *S. uliginosus* as a Ciscaucasian steppe species, A. Schchian (op. cit., p. 71) described a new species, *S. ketzkhovellii* Schchian, typical of the montane xerophyte formations of southern Transcaucasia. According to the description, it differs in the shape (clavate), color (brownish), and partly in the sculpture of the achenes (with indistinct transversely rugose ribs), as well as in geography (mountainous Armenia and Turkish Kurdistan). The type specimen, which we had the opportunity to study, does not entirely resemble the type specimen of *S. uliginosus*, since long glandular hairs (under a lens!) are visible on some involucral bracts. Specimens practically indistinguishable from *S. ketzkhovellii* with narrow subentire leaves, only 1–few capitula, and glabrous peduncles are at times found in the European part of the USSR, Siberia, and Central Asia. All this does not permit us to consider *S. ketzkhovellii* an independent species.

Among f. *glabrescens*, there are specimens collected at different times by Korshinsky and Kosinsky from the Volga delta. They are characterized by thin, large (15–20 cm long and 8–10 cm wide), shallowly sinuate-dentate leaves. I.M. Krascheninnikov (op. cit., p. 468) designated them

as *f. wolgensis* Krasch. On the other hand, a fairly large number of specimens from northern Kazakhstan and Central Asian Republics differ by having relatively narrow and stiff glaucous leaves.

4. ***S. arvensis f. brachyotus* (DC.) Kirp. stat. nov.**—*S. brachyotus* DC. Prodr. VII, 1 (1838) 186; Ldb. Fl. Ross. II, 2, 835; Kom. and Alis. Oprod. Rast. Dalnevost. Kr. II, 1098; Karav. Konsb. Fl. Yakutii 178; Boulos in Bot. Notis. CXIV (1961) 64. —*S. brachyotus* DC. var. *foliis elongatis integris* Kar. and Kir. in Bull. Soc. Nat. Mosc. XIV, 3 (1841) 458 (Enum. pl. a. 1840 in reg. Alt. et confin. collect.).—*S. maritimus* auct. non L.: Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 117 (Fl. baic.-dahur. II, No. 715; excl. sydon.—*S. nitido* Vill. and *S. littorali* Rchb. qui species europaeae sunt).—*S. shzucinianus* Turcz. ex Herd. in Bull. Soc. Nat. Mosc. XLIII, I, 2 (1870) 189, pro syn. (Pl. Raddeanae Monopet. IV, No. 233).—*S. arvensis* ssp. *brachyotus* Kitam. op. cit. 148.

DeCandolle described this form as a separate species from Altai and Dauria and compared it with the Mediterranean species *S. maritimus* L. It differs from typical *S. arvensis* mainly by its leaves, which are more or less rounded at the apex, often almost entire or small-toothed, with solitary teeth to weakly sinuate. Besides, achenes of *f. brachyotus* are usually slightly larger (3.5 long and 1 mm wide, whereas in the typical form they are 3 mm long and up to 0.8 mm wide), and the pappus is longer (up to 13 mm long, it rarely exceeds 10 mm in the typical form).

These differences, however, are far from being stable, and, besides, other forms of *S. arvensis* are also found within the range of *f. brachyotus*. Form *brachyotus* is not characteristic of the *locus classicus* and is mainly distributed in the Far East and outside the USSR in northern China, Mongolia, and Japan, often on saline soils.

In some regions, *S. arvensis* evidently hybridizes with *S. oleraceus*. Such hybrid forms are found, in particular, in the Novouzensk District of Saratov Region and the Kazlatovskii District of the Ural Region nearby.

Economic Importance. One of the pernicious perennial weeds, especially strongly infesting fields of spring crops. Besides its high seed productivity, this plant is capable of rapid regeneration even from small pieces of its fragile lateral roots ("propagation roots"). Eradication of field sow thistles is extremely difficult. The most common control measures are plowing, cutting of branches before flowering, application of herbicides, and so on, which are to be carried out at a general high-level of cultural practices. Detailed description of the biology of the field sow thistle and its control measures can be found in the article by V.F. Grodzinskaya *Osot polevaya*. "Biologiya Sornykh Rastenii". Posobie Uchitelya [Field Sow Thistle: In Biology of Weeds. Handbook for teachers]. Uchpedgiz, Moscow, 1960. At the same time, the field sow

thistle has some fodder values (for details cf. Larin et al. *Kormovye rasteniya senokosov i pastbishch SSSR* [Fodder Plants for Hay-fields and Pastures in the USSR] Vol. III. Sel'khozgis, Moscow-Leningrad, 1956, p. 671).

Series 4. Oleracei Kirp.—Achenes more or less strongly appressed, light- to dark-brown, often serrate along margin, usually with three longitudinal ribs, finely transversely rugose or smooth in-between.

Primarily an annual weed.

5. *S. oleraceus* L. Sp. pl. (1753) 794 (solum. α *leavis* and β ; excl. γ and δ .); Ldb. Fl. Ross. II, 833; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 115 (Fl. baic.-dahur. II, No. 713); Boiss. Fl. or. III, 795; Schmalh. Fl. II, 163; Kom. in Tr. Peterb. Bot. Sada, XXV, 776 (Fl. Man chzh. III, No. 1645); Fedtsch and Fler. Fl. Evrop. Ross. 1056; O. and B. Fedtsch Perech. Rast. Turk. IV, 348 (Consp. Fl. Turk. No. 2848); Kom. and Alis. Opred. Rast. Dalnevost. Kr. II, 1097; Grossh. Fl. Kavk. (1934) 254 and Opred. Rast. Kavk. 515'; Nevski in Sorn. Rast. SSSR IV, 337; Krasch. in Fl. Yugo-Vost. VI, 467; Perf. Fl. Sev. Kraya II–III, 376; Govorukhin, Fl. Urala, 522; Pavlov, Fl. Tsent. Kazakhst. III, 362; Sugaw. Ill. fl. Saghal. IV, 1925; Kolak. Fl. Abkhazii IV, 304; Kryl. Fl. Zap. Sib. XI, 3017; Klok. in Vizn. Rosl. URSS, 602; Cronquist in Gleason, New Britt. a Br. Ill. fl. N. Un. st. a. adjac. Canada, 3, 534; Schchian in Fl. Gruzii VIII, 675; Szafer, Kulcz., B. Pawl. Rosl. Polskie (1953) 742; Kirp. in Majewski, Fl. (1954) 631; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2, 1107; Dostál, Klíč (1954) 804; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1. 146 (Compos. Jap. V); Vorobev in Tr. Dalnevost. Fil. Ser. Bot. III (V), 78 (Materialy k. Fl. Kuril, skikh O-vov, No., 993); Stank. and Tal. Opred. Vyssh. Rast. (1957) 441; Karav. Konsp. Fl. Yakutii 178; Mikhailovskaja in Fl. BSSR V, 187; Popov, Fl. Sr. Sib. II, 788; Kirp. in Fl. Turkm. VII, 333, Nikitina, Mater. po Fl. Sev. Ski. Kirg. Ala-too 111, No. 1134; Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 448 (Fl. of Afghanistan 1960); Askerova in Fl. Azerb. VIII, 549; Vvedensky et al. Opred. Rast. Golodnoi Step. (1961) 40 (Tr. Tashk. Gos. Univ. Vysh. 178, Bot.); Kovalevskaja in Fl. Uzb. VI, 480.—*S. ciliatus* Lam. Fl. Fr. II (1778) 87.—*S. glaber* var. 1 and 2. Gilib. Fl. Lithuan. III (1781) 242; Ej. Exerc. phytol. I (1792) 193.—*S. levis* Vill. Hist. pl. Dauph. III (1789) 158.—*S. asper* Hall. ex Gaertn., Mey. and Scherb. Fl. Wett. III, 1 (1801) 125.—*S. oleraceus* β . M.B. Fl. taur.-cauc. II (1808) 239.—*S. roseus* Bess. in Spreng. Syst. veg. III (1826) 651.—*S. oleraceus* var. *rubrifolius* Lindem. in Bull. Soc. Nat. Mosc. XL, I, 2 (1867) 541.—*S. oleraceus*. α . *genuinus* Gruner in Tr. Obshch. Isp. Khar'k. Univ. VII (1873) 37.—*Sonchus rotundilobus* M. Pop. in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol.

- Vyp. 14 (1941) 106, nomen.—*S. rotundifolius* M. Pop. ex Vass. Sorn. Rast. Tadzh. 1 (1953) 440 (erroneo loco nominis praecedentis).—**lc.**: O.F. Müller, Fl. Danica IV (1777) t. 682 (color.); Rchb. f. Ic. fl. Germ. et Helvet. XIX (1858), t. 59 (MCCCCX) fig. 1; Syreistsch. Ill. Fl. Mosk. 255 Gub. III (1910) 333; Javorka and Csapody, Iconogr. F. Hungar. (1933), t. 560, fig. 4021; Sugaw. op. cit. 1924, t. 886 A; Cronquist in Gleason, op. cit. 534; Hegi, op. cit. t. 277, fig. 3 and 3a; Dostál, op. cit. 807, fig. 2227.—**Exs.**: Billot, Fl. Gall. et Germ. exs. No. 1911; Herb. Fl. Ingr. No. 363; Todaro, Fl. Sic. exs. No. 785; Sintenis and Rigo, It. cypr. 1880, No. 288; Bornm. It. pers.-turc. 1892–1893, No. 4110; Wolosz. Fl. polon. exs. No. 845; Sintenis, It. transcasp.-pers. 1900–1901 No. 366; Fl. terr. Israël. exs. No. 707.

Annual (sometimes biennial?). Root narrowly conical or fusiform. Stem 30–100 cm high, finely sulcate, fistular, simple or branched, glabrous or glandular-hairy above. Leaves not stiff, dull, 10–18(22) cm long and 5–7(12) cm wide, pinnatipartite or lyrate with large terminal, triangular lobe, finely sinuate-toothed, with somewhat spinescent teeth; lower leaves on winged petiole with wide amplexicaul base; upper leaves sessile, with sagittate auricles at base. Capitula mostly few (usually 5–15), in corymbose or umbellate-corymbose inflorescence; peduncles and bases of capitula arachnoid- or flocculose-lanate when young, sometimes glandular hairy; some capitula often undeveloped, normally with 100–125(150) florets. Involucre campanulate or bowl-shaped, 10–12 mm long and (6)10–15(25) mm wide; bracts dark green, usually three-rowed, sometimes dorsally with few glandular hairs. Corolla yellow, less often whitish. Achenes oblong-obovoid, somewhat narrowed toward base, more or less strongly compressed, light brown, brown, or dark brown, 2.5–3, mm long, 1 mm wide, weakly toothed along margin (under high magnification!), with three or less often more prominent longitudinal ribs on each side, finely rugose transversely; pappus of numerous thin, soft, white, almost smooth bristles (slightly barbed under high magnification), two times as long as achene. Flowering June to October. (Plate XVI, Fig. 8.)

A weed in fields, kitchen gardens, gardens, on irrigated lands, banks of mountain streams, less often on coastal sands; from lowlands to middle mountain zone.— *European Part*: all regions except northern part of Karelia-Lapland; *Caucasus*: all regions; *Western Siberia*: ?Ob', Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Yenisei, Lena-Kolyma (very rarely), Angara-Sayans, Dauria; *Far East*: Zeya-Bureya, Uda area, Ussuri, Sakhalin regions; *Soviet Central Asia*: Aralo-Caspian, Balkhash, Dzhungaria-Tarbagatai (Dzhungarian Alatau), Kyzyl-Kum, mountainous Turkmenia, Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: almost all over the world. Described from Europe. Type in London.

Note. The species is particularly notable for varying in leaf shape,

corolla color, and, less often, the number of longitudinal ribs on the achenes and nature of its surface.

Usually the following forms, without definite geographic correlation, are distinguished in *S. oleraceus* on the basis of the most striking character, the nature of the incision of the leaves.

256 1. ***S. oleraceus* f. *integrifolius*** (Wallr.) Kirp. stat. nov. —*S. oleraceus*. α . *integrifolius* Wallr. Sched. crit. I (1822) 432.—*S. oleraceus* γ . *integrifolius* Bisch. Beitr. z. Fl. Deutschl., Cichorieen (1851) 221.—Leaves undivided or subentire. Found rarely.

2. ***S. oleraceus* f. *triangularis*** (Wallr.) Kirp. stat. nov. —*S. oleraceus* β . *triangularis* Wallr. l.c. —*S. oleraceus* β . *runcinatus* W.D. Koch, Synops. fl. Germ. et Helvet. (1837) 433.—*S. oleraceus* var. α . *runcinatus* sub-var. *triangularis* Coss. and Germ. Fl. envir. Paris II (1845) 437.—*S. oleraceus* α . *runcinatus* Bisch. op. cit. 220.—Leaves usually pinnatipartite, runcinate, with large terminal conical lobe. Found generally and frequently.

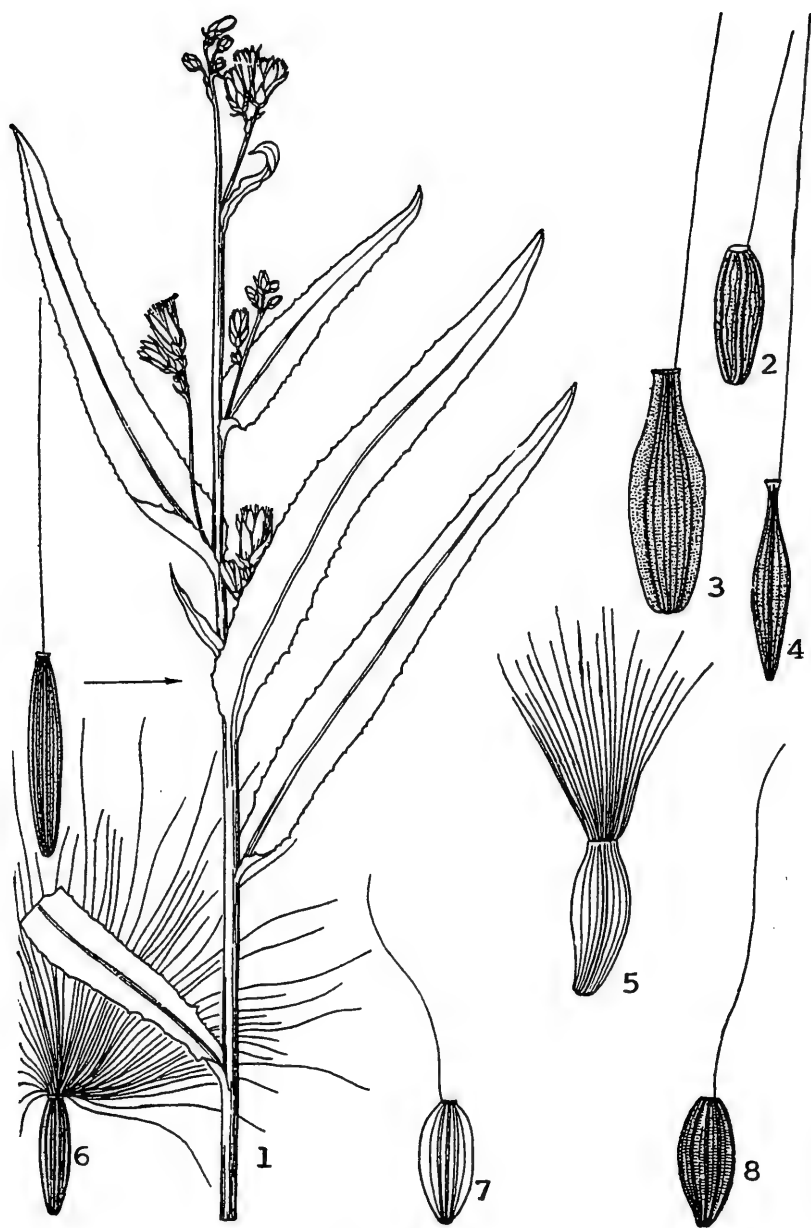
3. ***S. oleraceus* f. *lacerus*** (Wallr.) Kirp. stat. nov.—*S. oleraceus* γ . *lacerus* Wallr. l. c.—*S. lacerus* Willd. Sp. pl. III, 3 (1803) 1513.—*S. oleraceus* var. β . *lacerus* Coss. and Germ. l. c.—*S. oleraceus* β . *lacerus* Bisch. op. cit. 220.—Leaves pinnatifid or pinnatipartite, with sinuate-toothed lobes or segments; terminal lobe or segment weakly distinguishable from laterals. Found frequently.

Each of these forms may be represented by populations in which glandular hairs are found in the upper part and sometimes also on the involucre bracts, or by eglandular populations. In western European works, sometimes forms with differences in corolla color, growth vigor, and other characters of secondary importance for this species are separately designated.

S. oleraceus hybridizes with *S. asper*. Among these hybrids is included *S. rotundilobus* M. Pop. (cf. Kovalevskaja, op. cit. p. 481).

Economic Importance. A common weed which is eradicated by cultivation before fruiting and also by using herbicides. Young plants are relished by cattle and are particularly good for feeding pigs.

6. ***S. asper*** (L.) Hill, Herbar. Britan. I (1769) 47; Fedtsch. and Fler. Fl. Evrop. Ross. 1056; Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II 1097; Grossh. Fl. Kavk. IV (1934) 254 and Opred. Rast. Kavk. 515; Krasch. in Fl. Yugo-Vost. VI, 466; Govorukhin, Fl. Urala, 522; Takht. and Fed. Fl. Erevana (1945) 340; Kryl. Fl. Zap. Sib. XI 3017; Kolak. Fl. Abkhazii, IV, 304; Klok. in Vizn. Rosl. URSR, 602; Schchian in Fl. Gruzii VIII, 675; Cronquist in Gleason, New Britt. and Br. III. Fl. N.



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Plate XVI.

1—*Lactuca winkleri* Kirp., habit, achene; 2—*Sonchus palustris* L., achene; 3—*Lactuca sibirica* (L.) Benth. ex Maxim., achene; 4—*L. tatarica* (L.) C.A. Mey., achene; 5—*Sonchus sosnowskyi* Schchian, achene; 6—*S. arvensis* L., achene; 7—*S. asper* (L.) Hill., achene; 8—*S. oleraceus* L., achene.

- 258 Un. St. a. adjac. Canada 3, 534; Szafer, Kulcz., B. Pawl. Rośl. Polskie (1953) 742; Sobolevskaya, Konsp. Fl. Tuvy 200; Kirp. in Majevski, Fl (1954) 631; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2 1109; Dostál Klíč (1954) 804; Vorobev in Tr. Dal'nevost. Fil. Ser. Bot. III (V), 78 (Mater. pō Fl. Kuril'skikh o-vov, No. 993); Karav. Konsp. Fl. Yakutii 178; Mikhailovskaja in Fl. BSSR V, 188; Kirp. in Fl. Turkm. VII, 333; Askerova in Fl. Azerb. VIII, 549; Vvedensky et al. Opred. Rast. Golodnoi Stepi (1961) 41 (Tr. Tashk. Gos. Univ. Vysh. 178, Bot.); Kovalevskaja in Fl. Uzb. VI, 481. *S. oleraceus*; γ. *asper* and δ. L. Sp. pl. (1753) 794.—*S. spinosus* Lam. Fl. Fr. II (1778) 86.—*S. glaber* var. 3. Gilib. Fl. Lithuan. III (1781) 242; Ej. Exerc. Phytol. I (1792) 193.—*S. oleraceus* β. *asper* Falk. Beitr. II (1786) 232.—*S. asper* Vill. Hist. pl. Dauph. III (1789) 158; Ldb. Fl. Ross. II, 2, 834; Boiss. Fl. or. III, 796; Schmalh. Fl. II, 163; O. and B. Fedtsch. Perech. Rast. Turk. IV, 348 (Konsp. Fl. Turk. No. 2849); Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 185; Nevski in Sorn. Rast. SSSR IV, 338; Perf. Fl. Sev. Kr. II–III, 376; Pavlov Fl. Tsentr. Kazakhst. III, 363; Sugaw. Ill. fl. Saghal. IV, 1925; Popov, Fl. Sr. Sib. II, 788; Nikitina. Mater. po Fl. Sev. Skl. Kirg. Ala-too, 111, No. 1133.—*S. fallax* Wallr. Annus Bot. (1815) 98; Ej. Sched. crit. I (1822) 432; DC. prodr. VII, 1, 185.—*S. asper* Vill. b. *lacerus* Meinsh. Fl. Ingr. (1878) 188.—*S. eryngiifolius* Sosn. in Grossh. Fl. Kavk. IV (1934) 254 and Opred. Rast. Kavk. 515 (descr. ross.).—*S. eryngiifolius* Sosn. in Schchian in Zam. po Sist. i Geogr. Rast. Tbil. 15 (1949) 71 (descr. lat.).—**Ic.**: O.F. Müller, Fl. Danica, V (1782), t. 843 (color.); Hill, op. cit. t. 34, fig. 2; Rchb. f. Ic. fl. Germ. et Helvet. XIX (1858) t. 59 (MCCCCX), fig. 1 and t. 60 (MCCCCXI); Syreistsch. Ill. Fl. Mosk. Gub. III (1910) 334; Javorka and Csapody, Iconogr. Fl. Hungar. (1933), t. 560, fig. 4022; Nevski op. cit. 338, Fig. 491 (solum achenium); Sugaw. op. cit. t. 886, B; Cronquist in Gleason, op. cit. 534; Hegi, op. cit. 1109, fig. 789 (bona); Dostál, op. cit. 807, fig. 2228 (solum folium).—**Exs.**: Sch. Bip. Cichoriaceotheca Suppl. II, No. 156 (sub. *S. aspero* Fuchs); Rchb. Fl. Germ. exs. No. 1665 (sub *S. aspero* Hall.); Billot, Fl. Gall. et Germ. exs. No. 1912; Herb. Fl. Ingr. No. 364; Sintenis, It. transcap.-pers. 1900–1901, No. 1815a; Woronow, Pl. Abchaz. exs. (No. 266).

Annual. Root slender, narrowly conical or fusiform, usually branched. Stem (10)30–75(100) cm high, finely sulcate, fistular, simple or branched, glabrous or covered with dark, stalked, glandular hairs above. Leaves somewhat stiff or almost coriaceous, less often thin and soft, dark green or sometimes light bluish, oblong or obovate, 6–15 cm long and 1.5–8 cm wide, undivided, sinuate-pinnatifid, or, less often, pinnatisect, with unevenly spinescent teeth; lower leaves on winged petiole, middle and upper leaves sessile, with roundish auricles appressed to stem. Capitula less numerous (usually 5–10), in corymbose or umbellate-corymbose

- 259 inflorescence; peduncles glabrous or glandular hairy, often much longer than usually undeveloped capitula; fully developed capitula with 100–150 florets. Involucre campanulate or bowl-shaped, 10–12(15) mm long, (6)10–15(25) mm wide, bracts dark green, narrowly ovate, lanceolate or oblong, usually three-rowed. Corolla yellow. Achenes oblong-obovoid, flat, light- or dark-brown, 2.5–3(3.5) mm long and 0.75–1 mm wide, not rugose transversely (or weakly rugose), usually winged, weakly toothed (under high magnification!) along margin, mostly with three prominent longitudinal ribs on each side; pappus of numerous thin and soft, white, almost smooth, weakly toothed (under high magnification), fragile hairs, two times or slightly more as long as achenes. Flowering June to September (Plate XVI, Fig. 7).

Fields, kitchen gardens, orchards and vineyards, roadsides, weedy places, thickets of steppe shrubs, river valleys (in semidesert), and banks of canals; up to middle mountain zone.—*European Part*: all regions except northern part of Karelia-Lapland; *Caucasus*: All regions; *Western Siberia*: all regions; *Eastern Siberia*: all regions; *Far East*: (very rarely), Uda area, Ussuri (southern), Sakhalin regions; *Soviet Central Asia*: ?Aralo-Caspian (western part), Balkhash, Dzhungaria-Tarbagatai, Kyzyl-Kum, Kara-Kum (Krasnovodsk District), mountainous Turkmenia, Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: Scandinavia, central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, Armenia and Kurdistan, Iran, Indo-Himalayas, Dzhungaria. Kashgaria, ?Mongolia, Japan, China, North America. Besides, sporadically found in Central America, Australia and other regions. Described from Europe. Type in London.

Note. A species highly variable in the consistency and cutting of leaves. Two forms, which lack geographic discreteness, are well distinguished.

1. *S. asper* f. *inermis* (Bisch.) Kirp. stat. nov. *S. asper* α. *inermis* Bisch. Beitr. z. Fl. Deutschl., Cichorieen (1851) 222.—Cauline leaves fairly thin and smooth, oblong-ovate, entire, with short, not very stiff teeth.

2. *S. asper* f. *pungens* (Bisch.) Kirp. stat. nov.—*S. asper* β. *pungens* Bisch. l. c.—Cauline leaves more rough, often stiff or more or less coriaceous, deeply sinuate-toothed to sinuate or pinnatifid, with unequal, usually long, stiff, spinescent teeth.

Within these varieties, western European authors often further distinguish individual forms depending on the color of the lamina, presence or absence of glandular hairs on the peduncles, and so on.

S. eryngiifolius should be referred to *S. asper* f. *pungens*. This species was described as an endemic of inner montane Dagestan, growing in the natural formations of montane xerophytes. But identical specimens are

260 also found in Abkhazia and outside the Caucasus. The morphology of *S. eryngiifolius* (type specimen examined!) clearly indicates that its affinity is closest, not to *S. oleraceus* as stated in the original description, but to *S. asper*. *S. eryngiifolius* is one of the *S. oleraceus* × *S. asper* hybrids without a definite localized geographic area. The traces of transverse wrinkles on the achenes resemble those of *S. oleraceus*, but other achene characters (presence mostly of three, fine longitudinal ribs) and the morphology of the vegetative organs are close to *S. asper*. Apparently, *S. asper* f. *pungens* is represented on the whole, (if not entirely) by specimens of hybrid origin.

Not that long ago some authors considered *S. asper* as a whole as only a subspecies or variety of *S. oleraceus* (see, for example, A. Fiori, *Nuova flora analitica D'Italia*, Vol. II, Firenze, 1925–1929, pp. 861–817), but no one shares this viewpoint any longer.

Kitamura (S. Kitamura in *Res. Kyoto Univ. Exsp. Karak. a. Hinduk*. 1955, II (1960) 431 (Flora of Afghanistan)) cites *S. asper* Garsault, *Fig. pl. et anim. Med.* IV (1764) t. 565. We do not consider it necessary to accept the name of Garsault, because in composing it the rules of binomial nomenclature were inconsistently applied.

Meyer, Turczaninow, Ruprecht and some other Russian botanists cite *S. asper* Fuchs. Although the binomial name *S. asper* was actually used for the first time by Fuchs way back in 1542, this name, being pre-Linnaean, is not valid.

Economic Importance. It has little value as a fodder and food plant. According to some reports, it is a good honey-producing plant..

Doubtful and Deleted Species

1–2. ***S. amplexicaulis***, Gueldenst. and ***S. perfoliatus*** Gueldenst.—Both names were unclear already to C. Ledebour (he cited them with the remark “Quid?”). They also have been unclear to all subsequent workers, remaining unexplained nomina nuda until now.

2. ***S. tenerrimus*** L. *Sp. pl.* (1753) 794.

This Mediterranean species was wrongly reported for the Crimean flora by some foreign authors.

GENUS 1652. **Reichardia** Roth^{1,2}

Roth, *Bot. Abhandl. u. Beobacht.* (1787) 35.—*Picridium* Desf. *Fl. Atlant.* II (1799) 220.

¹ Treatment by M.E. Kirpic-nikov.

² Genus named in honor of Johann Jacob Reichard (1743–1782), a clinician and botanist, author of the then well-known *Flora of Frankfurt-on-Main*.

Capitula homogamous, many-flowered (containing up to 100 or more florets), terminating at apex of stem or its long branches. Involucre campanulate, cylindrical, or ovoid, four- or five-rowed, imbricate; bracts, 261 herbaceous, scarious along margin; innermost bracts two to four times as long as outermost bracts, often with barbule of thin hairs at apex. Receptacle flat, more or less alveolate; corolla yellow; anthers with short, sagittate, appressed basal appendages. Achenes polymorphic: outer achenes usually prismatic or oblong, four- or five-angled and with four or five deep furrows, transversely tuberculate or scarious-rugose; inner achenes usually slightly conical, less distinctly transversely tuberculate or transversely rugose. Pappus falling entirely, of numerous white, unequal hairs, basally connate into ring.

Lectotype of genus: *Reichardia tingitana* Roth.

Annual or perennial, herbaceous, glabrous plants growing on Canary Islands, in the Mediterranean countries, Ethiopia, Asia Minor, Iraq, Iran, ?Afghanistan, and the northwestern part of the Indian Peninsula. The genus includes in all seven or eight species, of which we have only one in the Caucasus.

1. **R. dichotoma** (Vahl) Freyn in Oest. Bot. Zeitschr. XLII (1892) 267; Post, Fl. or Syr., Palest. a. Sinai, ed. 2, II 152; Grossh. Fl. Kavk. IV (1934) 259 and Opred. Rast. Kavk. 517; Takht. and Fed. Fl. Erevana 341; Kolak. Fl. Abkhazii IV, 306; Schchian in Fl. Gruzii VIII, 694; Karjagin in Fl. Azerb. VIII, 562.—*Scorzonera dichotoma* Vahl, Symb. bot. II (1791) 89. *Sonchus dichotomus* Willd. Sp. pl. III, 3 (1803) 1517; M.B. Fl. taur.-cauc. II, 240.—*Picridum dichotomum* Fisch. and Mey. ex DC. Prodr. VII, 1 (1838) 183; Ldb. Fl. Ross. II, 2, 832; Boiss. Fl. or. III, 829.—**lc.**: Karjagin. op. cit. 516, Plate LVII.—**Exs.** Bornm. Pl. exs. Anatol. or. 1889, No. 701; Sintenis, It. or. 1892, No. 4503.

Perennial. Stem (30)60–100 cm high, weakly sulcate, glabrous, more or less strongly divaricately branched, with long, upward-directed branches, terminating in capitulum. Leaves flat, glaucous, oblong-linear, linear-lobate, or broadly lanceolate, sinuate-lobate or more or less undivided, spinose-toothed or spinose along margin, weakly crisped-flexuous; lower leaves on winged semiamplexicaul petiole, often clustered in rosette, upper leaves reduced, sessile, auriculate. Capitula with (35)50–70(100) florets. Involucre campanulate-cylindrical or campanulate, (6)10–15(20) mm long; involucre bracts four- or five-rowed, herbaceous, usually purple; scarious along margin, very finely appressed-hairy dorsally (under high magnification!); inner (longest) bracts subobtusate with barbules of very thin and short hairs (under a hand lens!). Corolla light yellow. Achenes polymorphic: outer achenes prismatic or campanulate, four-, less often five-angled, 4–5(7) mm long and 0.7–0.8(1.2) mm wide, dark brown,

with four or five longitudinal furrows, transversely rugose; becoming
 262 lighter in color towards centre of achene, tubercles disappearing gradually;
 innermost achenes light or stramineous, more or less smooth; pappus one
 and one-half to two times as long as achene, of almost entirely smooth,
 numerous thin hairs white or yellowish below, few among them thicker
 (under lens!). Flowering July to September. (Plate XIX, Fig. 8).

In mountains, on dry clayey and stony slopes, in dry riverbeds.—
Caucasus: all regions except Talysh. *General distribution*: eastern
 Mediterranean, Balkans-Asia Minor (Asia Minor), Armenia and Kurdistan,
 Iran (northern). Described from Tunisia. Type possibly in Copenhagen.

Note. Grossheim and other authors of the Flora of Caucasus used
 the name "*Reichardia dichotoma* (M.B.) Roth." In fact, Albrecht Roth
 never used such a combination.

Contrary to the generally held opinion, "*Sonchus dichotomus* M.B." should not be the basionym for *R. dichotoma*. Marschall-Bieberstein did not describe such a species; he clearly indicated that the specimens collected from the North Caucasus and the region of the present Tbilisi were included by him under *S. dichotomus* Willd.

GENUS 1653. *Prenanthes* L.^{1,2}

L. Sp. pl. (1753) 797, p. p.; DC. Prodr. VII, 1 (1838) 194, p. p.;
 Benth. in Benth. and Hook. f. Gen. pl. (1873) 527; O. Hoffm. in
 Pflanzenfam. IV, 5 (1894) 375.

Capitula homogamous, with variable number of flowers (5, 8–10, 15
 or 25–35 florets), Narrowly cylindrical, narrowly campanulate or very
 rarely ovoid, in lax paniculate, less often racemose- or corymbose-
 paniculate inflorescence. Involucre two- or three (four)-rowed bracts;
 herbaceous, usually dark (dirty green, dark violet, etc.) or dorsally
 pubescent (under a hand lens!) (sometimes covered with papilliform hairs)
 with isolated, erect, thin, scaly, often glandular hairs. Receptacle glabrous,
 flat. Achenes oblong-linear or linear, usually slightly compressed, less
 often almost terete, with inconspicuous longitudinal ribs (only with
 nonspecific striation), or ribs four or five, more or less well developed,
 sometimes more numerous and distinct, achenes covered with numerous,
 short, erect hairs (visible under a hand lens!), less often more or less
 glabrous, usually slightly narrowed toward base, without beak but with
 263 broad disk at apex with deciduous pappus, less often pappus persistent;
 pappus bristles numerous, dirty-rusty or light rusty, sometimes white,

¹ Treatment by M.E. Kirpicznikov.

² From the Greek words *prenes*—inclined forward and *anthos*—flower; the name indicates a weak general inflorescence often inclined forward.

distinctly barbed almost throughout smooth (visible only under high magnification). Basic chromosome number $x = 9, 8$.

Lectotype of genus: *Prenanthes purpurea*, L.

Perennial herb, distributed mainly in Eurasia and North America. The genus comprises about 25 species. However, this number is very approximate, as even among the Lactuceae, the genus *Prenanthes* is known for its indistinct boundaries. Because of the present trend of combining *Nabalus* with *Prenanthes*, which we have also followed for the "*Flora of the USSR*," the limits of the latter genus become even more indistinct.

1. Corolla yellow; florets in capitulum 15–35 2.
- + Corolla light blue, purple or violet-purple, if light colored, then florets in capitulum fewer 4.
2. Florets about 15 per capitulum; laminas oblong elliptical, linear or linear-lanceolate. Species growing in Altai and Tuva ASSR ..
..... 7. **P. angustifolia** Boulos.
- + Florets 25–35 per capitulum; laminas of cauline leaves lyrate-pinnatisect or rotund-triangular to triangular 3.
3. Achenes 7–8 mm long, with numerous prominent longitudinal ribs; pappus of dirty rusty or rusty, often barbed hairs. Plants growing in the Far East 5. **P. maximowiczii** Kirp.
- + Achenes about 4 mm long, with four or five distinctly raised and indefinite number of less distinct longitudinal ribs; pappus of snow-white, almost entirely smooth hairs. Plants growing in the Caucasus
..... 6. **P. abietina** (Boiss.) Kirp.
- 4(1) Capitula with few, usually five florets each 5.
- + Capitula with larger number of florets 6.
5. Lamina and petioles more or less densely covered with scaly hairs, and sometimes also spinulose; pappus hairs dirty-rusty or almost rusty. Species growing in the Far East
..... 2 **P. tatarinowii** Maxim.
- + Lamina and petioles without scaly hairs or spinules; pappus hairs white. Species growing in the European part of the USSR and the Caucasus 1. **P. purpurea** L.
- 6(4) Florets usually 8–10 per capitulum; leaves more or less crowded in lower part of stem, with relatively small lamina, 3–5 cm wide at base, and 8–10 cm long; stem 30–50(70) cm high, slender (usually 1–3 mm thick). Plants mainly distributed in western Transcaucasia 4. **P. pontica** (Boiss.) Leskov.
- + Florets about 15 per capitulum. Plants more or less uniformly leafy; lower leaves usually much larger. Stem 50–100(150) cm high, thicker. Species growing almost throughout the Caucasus
..... 3. **P. cacaliifolia** (M.B.) Beauverd

Subgenus 1. Prenanthes.—*Prenanthes* subgen. *Euprenanthes* Babcock. Stebbins and Jenkins in *Cytologia*, Fujii Jubil. vol. (1937) 190, solum nomen.—Capitula with 5–15 florets; corolla light blue, purple, purple-violet, or lilac, less often pale with violet tip; achenes dark brown, with few prominent longitudinal ribs. Plants mainly of the Old World.

Type of subgenus: type of genus.

1. ***P. purpurea*** L. Sp. pl. (1753) 797; DC. Prodr. VII, 1, 194; Ldb. Fl. Ross. II, 2, 839; Boiss. Fl. or. III, 803; Schmalh. Fl. II, 170; Fedtsch. and Fler. Fl. Evrop. Ross. 1064; Popov, Ocherk Rast. i Fl. Karpat 256; Klok. in Vizn. Rosl. URSR 605; Stank. and Tal. Oprod. Vys. Rast. (1957) 444; Grossh. Fl. Kavk. IV (1934) 265 and Oprod. Rast. Kavk. 519; Kolak. Fl. Abkhazii IV, 310; Schchian in Fl. Gruzii VIII, 709; Szafer, Kulcz., B. Pawl. Rośl. Polskie (1953) 744; Dostál, Kléč (1954) 802; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2, 1180. —*P. tenuifolia* L. op. cit. 797; Ldb. op. cit. 839.—*Chondrilla purpurea* Lam. Fl. Fr. II (1778) 105. —*C. tenuifolia* Lam. Encycl. méth. II (1786) 78.—*Prenanthes purpurea* var. *tenuifolia* W.D. Koch, Taschenb. d. Deutsch. u. Schweiz. Fl. (1844) 316. —*P. purpurea*. β. *angustifolia* W.D. Koch, Synops. fl. Germ. et Halvet. ed. 2, II (1844) 494; Boiss. Fl. or. III, 803; Grossh. Fl. Kavk. IV (1934) 265.—**Ic.:** Rchb. f. Ic. fl. Germ. et Helv. XIX (1858), t. 57 (MCCCCVIII); Fedtsch. and Fler. op. cit. 1064, Fig. 1078; Bonnier, Fl. Compl. III. France, Suisse et Belg. VI (1923), t. 352, fig. 1685 (color.); Javorka and Csapody, Iconogr. Fl. Hungar. (1933), t. 566, fig. 4061 (bona); Szafer, Kulcz., B. Pawl. op. cit. 745, fig. 1648; Dostál, op. cit. 803, fig. 2224; Hegi, op. cit. t. 279, fig. 1 (color, bona).—**Exs.:** Fl. Cauc. exs. No. 173; Baldacci, It. Alb. 1900, No. 183; Fl. exs. austro-hung. No. 3399; Hayek, Fl. Stir. exs. No. 1092; Fl. exs. reip. Bohem.-Slov. No. 276; Pl. Polon. exs. No. 379.

Perennial. Rhizome slender, woody. Stem 60–100(150) cm high, usually solitary, glabrous or subglabrous, paniculately branched above. Leaves thin, variable, usually lanceolate, oblong-elliptical or oblong-linear, acute, glaucous beneath, green above; lower leaves mostly on winged petiole, almost entire with slightly toothed margin to sinuate-toothed and lyrate-pinnatifid with large terminal lobe; middle and upper
265 leaves sessile, semiamplexicaul, more or less entire, upper leaves smaller, with distinctly auriculate base; sometimes all or most leaves oblong-linear or linear-lanceolate to linear, entire or almost entire (var. *angustifolia* W.D. Koch). Capitula cylindrical, 12–15 mm long and 3 mm wide, drooping, terminal on slender branches of lax panicle, sometimes up to 20–35 cm long; basal branches of panicle arising from axils of rather large upper leaves. Involucre two- or three-rowed; outer involucral bracts oblong-ovate, dark, with more or less dense, often papilliform pubescence (under a hand lens!); innermost bracts two to three times as long as outer,

linear or oblong-lanceolate, greenish in lower part, usually dark violet above, bordered along edges, subobtusate, with short barbules of thin, light colored, hairs (under a hand lens!); florets in capitulum usually five; corolla purple or violet-purple, its lobes covered with papilliform hairs. Achenes 4.5–5 mm long, about 1 mm wide, oblong-linear, weakly compressed, dark brown, glabrous, with slightly raised ribs; pappus of numerous white, slightly barbed (under high magnification!) bristles, 7.5–8 mm long. Flowering (June) July to August (September). (Plate XXIII, Fig. 3).

Montane forests, at 700–2,000(2,400) m. *European Part*: Upper Dniester (Carpathians); *Caucasus*: Ciscaucasia, Dagestan, Eastern Transcaucasia, Western Transcaucasia. *General distribution*: Central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, Armenia and Kurdistan (Artvin District). Described from western Europe. Type in London.

Note. The species *Prenanthes tenuifolia* L., described by Linnaeus from the Alps of southern Europe, has not been recognized as an independent taxon by the large majority of authors. However, the specimens from the Caucasus referred by us to *P. purpurea* differ slightly from the European members of this species by having more entire, narrow leaves, on the basis of which Ledebour referred the Caucasian plant to *P. tenuifolia* L. This difference is far from being consistent; therefore, the predominant point of view at present about the need for combining the two species into one appears to be correct.

2. ***P. tatarinowii*** Maxim. in Mém. Acad. Pétersb. div. sav. IX (1859) 474 (Primit. Fl. Amur., sine numero, in nota); Kom. in Tr. Peterb. Bot. Sada XXV, 788 (Fl. Man'chzh. III, No. 1656); Kom. and Alis. Opređ. Rast. Dal'nevost. Kr. II, 1102; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 200; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1, 154 (Compos. Jap. V).—*Lactuca tatarinowii* Franch. in Morot, Journ. de Bot. IX (1895) 293.—*Nabulus tatarinowii* Nakai in Fl. Sylv. Kor. XIV (1923) 116; Kitag. in Report. Inst. Res. Manch. III, App. 1, 460 (Lineam. fl. Manschur.).

Perennial. Rhizome? Stem 70–110(160) cm high, paniculately branched above, 6–8 mm near base and here, usually with setose scaly hairs, more or less glabrous above to general inflorescence. Leaves thin, with distinct network of veins, on long petioles, as also lamina, more or less densely covered with scaly hairs or spinules; lower leaves lyrate, large, with hastate-cordate or triangular-hastate terminal segment, terminating in hastate cusp; segment unequally toothed with isolated spinules and scaly hairs in-between; lateral segments remote, one pair, ovate-oblong or oblong; middle cauline leaves smaller, lower or entire (without lateral segments), with less distinct cordate base; upper cauline

leaves irregularly rhombic or angular-ovate, uppermost leaves lanceolate or narrowly lanceolate. Capitula cylindrical, 9–10(12) mm long, on erect branches, in lax, often very large, paniculate general inflorescence, peduncles short, slender, densely covered with large or scaly glandular hairs, often with one to few reduced, scaly, reddish leaves. Involucre two- or three-rowed; outer involucre bracts very short, inner usually five, one-rowed, oblong-linear or linear, with isolated erect curly or scaly, but fine, usually glandular, hairs on dorsal side (under lens!). Florets in capitulum usually five; corolla light blue or pale with violet tips. Achenes about 4 mm long and 0.6–0.8 mm wide, terete, usually with five longitudinal, prominent ribs, dark brown, almost glabrous (at high magnification very short hairs visible), slightly narrowed toward base, with broad apical disk bearing pappus of numerous thin, dirty-rusty or rusty, barbed, 6–7 mm-long bristles. Flowering July to September(October) (Plate XXIII, Fig. 5).

In broad-leaved and mixed shady forests as well as on gravels along brooks and streams.—*Far East*: Ussuri (mostly southern part). *General distribution*: Japan?, China, Korean Peninsula. (Earlier reported from Japan, but, according to S. Kitamura, by mistake; besides, one doubtful sheet from Sakhalin Island is preserved in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR.) Described from vicinity of Beijing. Type and isotype in Leningrad.

3. *P. cacaliifolia* (M.B.) Beauverd in Bull. Soc. Bot. Genève 2 Sér. II (1910) 114 and 115 (“*P. cacaliaefolia*”; seorsum impressum: Contrib. a l'étude des Compos. III, p. 16 and 17).—*Sonchus cacaliaefolius* M.B. Fl. taur.-cauc. II (1808) 241 and III (1819) 527. —*Mulgedium cacaliaefolium* DC. Prodr. VII, 1 (1838) 250; Ldb. Fl. Ross. II, 2 (1845–1846) 841 (incl. α . *genuinum*, β . *appendiculatum* and γ . *giganteum* Ldb.) Boiss. Fl. or. III (1875) 801 (excl. *minus* Boiss.).—*M. petiolatum* C. Koch in Linnaea XVII (1843) 279.—*Cicerbita cacaliaefolia* Beauverd Grossh. 267 Fl. Kavk. IV (1934) 253 and Opred. Rast. Kavk. 514; Schchian in Fl. Gruzii VIII, 672; Askerova in Fl. Azerb. VIII, 545.—*Exs.*: Balansa., Pl. d'Or. (Reliq. Mailleanae) No. 1466 (sub *Mulgedio lazico* Boiss.).

Perennial. Rhizome about 1 cm wide, usually short, hard. Stem 50–100(150) cm high, usually solitary, slightly sulcate, glabrous or subglabrous below, paniculately branched above and more or less densely covered with fine, scaly, glandular hairs. Leaves thin, scaly or more or less so; lower leaves hastate-cordate or deltoid-hastate with deeply sinuate cordate-reniform base, aristate, shallow and unequally sinuate-toothed, teeth soft and short-cuspidate, lamina green above and gray or glaucous beneath, with long, gradually expanded semiamplexicaul sheathing petiole, sometimes divided and then with one or two or, less often, few usually oblong segments; in very rare cases, lamina of lower leaves divided into

few segments or lobes; upper leaves on broad semiamplexicaul petioles, highly variable (oblong to lanceolate and linear), with strongly divided and toothed lamina, or more or less entire with cusp; uppermost leaves strongly reduced. Capitula narrow-campanulate, (10)12–14(15) mm long, at apices of slender peduncles of paniculate inflorescence, usually exceeding capitula and densely covered with fine, scaly, glandular hairs. Involucre usually two-rowed; involucre bracts oblong-linear, subobtusate or obtuse, on back more or less densely covered with hairs-like peduncle, but sometimes light or dark-violet; florets in capitulum about 15; corolla light blue. Achenes about 5 mm long, and 1 mm wide, oblong-cylindrical, slightly flattened, usually with five prominent ribs, light brown, densely covered with very short, light colored, upward-directed hairs (under high magnification!); pappus of numerous dirty white or light rusty, slightly barbed (under a hand lens!) hairs, reaching 7–8 mm in length. Flowering July to October. (Plate XXIII, Fig. 6.)

Middle mountain and subalpine zones up to 2,500 m; deciduous (predominantly beech), mixed and coniferous forests, forested ravines, less often in thickets of shrubs and tall grass; rarely in humid forests of lower mountain zone.—*Caucasus*: Ciscaucasia, Dagestan, Eastern and Western Transcaucasia, ?Southern Transcaucasia (needs confirmation!). *General distribution*: Balkans-Asia Minor (Lazistan, Trabzon). Described from Georgia. Type in Leningrad.

Note. The species is highly variable in the shape and size of the leaves, as well as in the size of the plant as a whole. This provided grounds to Ledebour to distinguish three varieties, which, however, could hardly rank above a form and do not have serious taxonomic significance.

- 268 4. ***P. pontica*** (Boiss.) Leskov in Tr. Bot. Muz. XXV (1932) 44.—*Mulgedium ponticum* Boiss in Ann. Sc. Nat. 4. Sér. II (1854) 248; id. in Tchihatch. As. Min. Botanique II (1860) 385. *M. cacaliaefolium* β. *minus* Boiss. Fl. or. III (1875) 801.—*Prenanthes cacaliaefolia* Beauverd var. *minor* Beauverd in Bull. Soc. Bot. Genève 2 Sér. II (1910) 115 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 17).—*Cicerbita pontica* Grossh. Fl. Kavk IV (1934) 250 and Opred. Rast. Kavk. 514; Kolak Fl. Abkhazii IV, 300; Schchian in Fl. Gruzii VIII, 671. — *P. cacaliaefolia* Beauverd ssp. *minus* Stebbins in sched. (1938).—**lc.**: Tchihatch. As. Min. Atlas (1860), t. 34 (ic. optima!); Kolak, op. cit. Plate XXIX (ic, admodum mediocris).—**Exs.**: GRF No. 323 (sub *Mulgedio cacaliaefolio*).

Perennial. Rhizome mostly short. Stem 30–50(70) cm high, slender (usually 1–3 mm thick), simple and weakly pubescent to glabrous below, somewhat paniculately branched above and densely covered with very fine, often violet, scaly, glandular hairs. Leaves thin, crowded mainly in lower part of stem, hastate-cordate, cordate-ovate or deltoid-hastate with

deeply emarginate base, acute, unevenly sinuate-toothed with teeth softly short-cuspidate; lamina green above, glaucous beneath, with flat, semiamplexicaul, slightly sheathing, petiole at base almost equaling lamina or longer; upper leaves usually one to few, sessile, often comprising expanded petiolar base and short, reduced, divided lamina, or lamina more or less entire, oblong-lanceolate, linear-lanceolate or linear; uppermost leaves (on inflorescence branches and peduncles) scaly. Capitula cylindrical or narrow-campanulate, about 12–13 mm long, at apices of slender, usually longer, peduncles of well-developed inflorescence than capitula and densely covered with fine scaly glandular hairs. Involucre two- or three-rowed; involucre bracts often violet, outer bracts on back covered with hairs like peduncles; inner bracts longer, obtuse, with fewer glandular hairs, or eglandular. Florets in capitulum usually 8–10; corolla light blue. Achenes about 5 mm long and 1 mm wide, oblong-cylindrical, slightly flattened, usually with five distinctly raised longitudinal ribs and large number of inconspicuous or almost indistinct ribs in-between, light brown, densely covered with very short, light colored, upward-directed hairs (under high magnification!); pappus of numerous dirty white or light rusty barbed (under a lens!) bristles, 7–8 mm long. Flowering August to October. (Plate XXIII, Fig. 7.)

Mountain forests and edges up to subalpine zone. —*Caucasus*: Ciscaucasia (Ossetia), Western Transcaucasia (Black Sea Coast—Sochi District, Abkhazia, Colchis, Kutaisi District, Adzharia), ?Eastern Transcaucasia (Zakataly District; imprecise data). *General distribution*: Balkans-Asia Minor (Pontic Range). Described from Turkey. Type in Geneva.

Note. A species very closely related to *P. cacaliifolia* with which, possibly, it hybridizes in areas of contact. However, *P. pontica* differs from *P. cacaliifolia* by having a smaller size, more slender stem, lamina of the lower leaves reaching the base and usually (3)5–8(10) cm long (in *P. cacaliifolia*, lamina, as a rule, larger); the petiole usually only slightly expanded at the base; leaves mainly crowded in the lower part of stem; a smaller number of florets in the capitulum; a comparatively weakly developed inflorescence and several other features. These morphological differences and the distinct geographic range compel us to consider *P. pontica* as a separate species and not include it as a subordinate taxon under *P. cacaliifolia*.

Subgenus 2. *Nabalis* (Cass.) Babcock, Stebbins and Jenkins in Cytologia, Fujii Jubil. vol. (1937) 190—*Nabalis* Cass. in Dict. sc. nat. XXXIV (1825) 94.—*Prenanthes* sect. *Nabalis* Kitam. in Mém. coll. Sc. Univ. Kyoto, ser. B, XXIII, 1 (1956) 152, p. p. (Compos. Jap. V).—Capitula with 25–35 flowers; corolla yellow or whitish; achenes yellow

or dark brown, terete with numerous longitudinal ribs. Primarily a New World plant.

Lectotype of subgenus: *Prenanthes alba* L.

5. *P. maximowiczii* Kirp. nom. nov.—*Nabalus ochroleucus* Maxim. in Bull. Acad. Sc. Pétersb. XV (1870) 376.—*Prenanthes ochroleuca* Hemsl. in Journ. Linn Soc. XXIII (1888) 486 (non Rafin., 1824); Kom. in Tr. Peterb. Bot. Sada XXV, 789 (Fl. Man'chzh. III, No'. 1657); Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II, 1102; Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1, 153 (Compos. Jap.).—*Lactuca ochroleuca* Franch. in Morot, Journ. de Bot. IX (1895) 293.

Perennial. Plants often with strong rhizome, Stem 70–100(120) cm high, sulcate, up to 9 mm thick at base, in lower part densely covered with scaly, dark brown, hairs or (less often) more or less glabrous, branched above and covered with crisped, less often mixed with scaly setose, hairs. Lower leaves (early-withering) and middle cauline leaves large, lyrate-pinnatisect, on very long, winged, expanded at base and semiamplexicaul petiole, usually covered beneath with scaly hairs; terminal segment triangular or irregularly rhomboid, lateral segments two to four, oblong or broadly ovate, or rhomboic, sometimes irregular in shape; all segments acute, irregularly coarsely toothed-sinuate, with teeth terminating 270 into obtuse spinules; upper leaves strongly reduced, sessile, usually lanceolate or oblong, often densely setose at base. Capitula with 25–30 florets, narrow-campanulate, at fruiting about 15 mm long, on unequal peduncles, densely covered with short crisped hairs (under a lens!) and often in compact racemose-paniculate inflorescence. Involucre two- or three-rowed; involucre bracts dirty green, with scaly erect hairs on back. Corolla yellow. Achenes 7–8 mm long and about 0.6 wide, terete, with numerous, prominent longitudinal ribs, yellow or dark brown, very densely covered with light colored, upward-directed, short hairs (under high magnification!), somewhat distinctly narrowed toward base, with almost quadrate, smooth, corona-like process at apex, bearing pappus of numerous, dirty-rusty or rusty, finely barbed 6–7(8) mm-long bristles. Flowering August to September (Plate XXIII, Fig. 9).

Wet meadows, along streams and near springs, moist forest glades, and also shrub thickets on marshy soil.—*Far East*: Ussuri (southern part). *General distribution*: Japan and China (northeastern China), Korean Peninsula. Described from vicinity of Vladivostok. Type and isotype in Leningrad.

Note. It has always been said that the first date of publication of the basionym of this species was in 1871. However, according to the data on page 384 of Vol. XV, "*Bull. Acad. Sc. Pétersb.*," this publication came off the press on November 11, 1870.



Species of Doubtful Taxonomic Position

6. **P. abietina** (Boiss.) Kirp. comb. nova.—*Mulgedium abietinum* Boiss. and Bal. ex Boiss. Fl. or. III (1875) 802.—*Cicerbita abietina* Beauverd ex Grossh. Fl. Kavk. IV (1934) 252 and Opred. Rast. Kavk. 514.—*C. abietina* Stebbins in Journ. Bot. Lond. LXXV (1937) 16.—*Lactuca abietina* Bornm. in Mitt. Thür. Bot. Ver. n. s. XX (1904–1905) 25.—*Crepis abietina* Beauverd in Bull. Soc. Bot. 2 Sér. II (1910) 115; Kolak. Fl. Abkhazii IV, 308; Schchian in Fl. Gruzii VIII, 700.

Perennial. Rhizome about 1 cm thick, annually producing solitary herbaceous stem from apex; previous year's stems preserved as fragments with remnants of leaves; adventitious roots slender, cord-like to almost
272 filiform, fewer. Stem 90–150 cm high, 5–10 mm thick at base, weakly branched near apex, sulcate, fistular, entirely or almost entirely glabrous. Leaves petiolate; lower leaves on long petioles as long as or exceeding lamina, middle leaves on shorter petioles almost half as long as lamina, and upper leaves short-petiolate or more or less sessile; lamina very thin, almost chartaceous, with distinct network of veins, rotund-triangular or triangular, more or less acuminate, cordate-hastate at base, margin broadly but shallow sinuate or coarsely large and obtusely toothed, with thin soft spinose processes; less often petioles with small leafy auricles. Capitula ovoid or campanulate, 5–10 mm wide and about 1 cm long, few, on long peduncles slightly expanded above (below capitula), in lax paniculate-corymbose inflorescence; sometimes capitula arising from axils of upper leaves, less often only few or solitary. Involucral bracts two- to four-rowed linear-lanceolate, dirty dark green to almost black. Capitula with 30–35 florets; corolla light- or bright-yellow, two times or more as long as capitulum. Achenes about 4 mm long and 1 mm wide, slightly flattened, almost terete or indistinctly four- or five-angled, slightly narrowed toward apex and near base, usually with four or five more strongly protecting ribs and indefinite number of less conspicuous ribs, dark brown, densely covered with very short, light-colored hairs (under high magnification!); pappus of snow-white, almost entirely smooth, persistent hairs, slightly exceeding achene. Flowering (June) July to August. (Plate XXIII, Fig. 4.)

Montane forests to their upper limit, less often in tall-grass and secondary mountain meadows; mostly under forest cover (beech, fir, pine; elfin woodland) or in thickets of rhododendron.—*Caucasus*: Ciscaucasia, Eastern Transcaucasia, ?Western Transcaucasia. *General distribution*: Balkans-Asia Minor (Asia Minor). Described from Lazistan. Type in Geneva.

Note. Many authors have included this species under the genus *Cicerbita*, from which it differs by the absence of an outer pappus, the

firmly attached hairs of the inner pappus, a larger number of florets in capitulum, and other characters.

According to Boissier (op. cit. 803), this plant occupies an "intermediate position between *Crepis* and *Mulgedium*," but "because of the appressed achenes, which are smaller than the persistent pappus," it should be placed in the genus *Mulgedium* (despite the persistent pappus). Actually the achenes are little or, often, not at all compressed. Morphologically, this species is similar to some species of *Crepis*, but the possibility of its belonging to this genus was refuted by such distinguished specialists of *Crepis* as Babcock and Stebbins.

At present, it is most appropriate to assign this species to the genus *Prenanthes*, to which it is closest in the structure of its achenes. True, the long overdue revision of *Prenanthes*, whose heterogeneous nature was
273 reported by botanists already at the beginning of the 19th century, may introduce significant changes even in the position of the species under consideration.

7. ***P. angustifolia*** Boulos in Bot. Notis. CXV (1962) 59.—*Sonchus dentatus*. Ldb. Ic. pi. fl. Ross. 1 (1829) 21; Ej. Fl. Alt. IV (1833) 141; DC. Prodr. VII, 1, 187; Ldb. Fl. Ross. II, 2, 835; Kryl. Fl. Zap. Sib. XI, 3019; Sobolevskaya, Konsp. Fl. Tuvy 200; Grubov, Konsp. Fl. MNR 282—No. 1854 (Tr. Mong. Kom. Vyp. 67).—**lc.**: Ldb., op. cit. (1829) t. 87 (color., bona).

Perennial. Rhizome more or less long, 2–6(10) mm thick. Stem (7)10–50(65) cm high, slender, indistinctly sulcate, glabrous or subglabrous, more or less strongly (sometimes right from base) branched. Leaves crowded in lower part of stem, oblong-elliptical, linear-lanceolate or linear, shallow sinuate-toothed or toothed, sparsely spinulose, on short, narrow-winged, semiamplexicaul petiole; middle and upper leaves distant, entire, sessile, strongly reduced to scaly, with fertile axillary branches. Capitula with about 15 florets, usually less numerous, in corymbose or corymbose-paniculate inflorescence; peduncles unequal, slender, covered with short crisped or longer scaly hairs, or glabrous. Involucre oblong-cylindrical or narrow-campanulate, about 10 mm long, 4–7(10) mm wide, usually two-rowed; involucrel; bracts dark, dirty green, linear or oblong-lanceolate, on back covered with long, narrow, scaly, yellowish-green, erect hairs or glabrous; inner bracts with barbules of thin light colored hairs (under a lens!) at apex. Achenes oblong or oblong-ellipsoid, slightly flattened, dark violet, 4.5–6 mm long, 1–1.25 mm wide, with about 10 prominent longitudinal ribs, and light yellowish constriction at apex, covered with numerous, very short, upward-directed hairs (under a hand lens!); pappus of fine, white or slightly grayish, weakly barbed (under a lens!) bristles, as long as achene or longer. Flowering June to August. (Plate XXIII, Fig. 8.)

On more or less wet saline soils; meadows, banks of reservoirs—*Western Siberia*: Altai; *Eastern Siberia*: Angara-Sayan (Tuva ASSR)? *General distribution*: Mongolia. Described from Altai (Chuya River). Type in Leningrad.

Note. Considering the achene structure, number of florets per capitulum, nature of the involucre bracts and other characters, this species cannot be kept in the genus *Sonchus*. It occupies an intermediate position between *Prenanthes* and subgenus *Mulgedium* of *Lactuca*, but is somewhat closer to the former. *P. angustifolia* differs from typical *Prenanthes* by the yellow color of the corolla and the leaf shape; and from *Mulgedium*, again by the corolla color (in *Mulgedium* it is light blue), as well as the achene shape.

274 The name *P. dentata* cannot be used in view of the existence of an earlier homonym.

The plants vary markedly in the nature of the pubescence, extent of branching, and growth vigor. A form with involucre bracts lacking scaly hairs is found in the Tuva ASSR and in Mongolia. Most such plants were labeled *Sonchus dentatus* Ldb. var. *glabrisquameus* Krasch. and Iljin" by Iljin in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR.

Doubtful and Deleted Species

1. ***P. alata*** (Hook.) Dietr. Synops. plant. IV (1847) 1309.—*Nabalus alatus* Hook. Fl. Bor. Amer. I (1833) 294, t. 102; Ldb. Fl. Ross. II, 2, 840.—*Sonchus hastatus* Less. in Linnaea, VI (1831) 99.—*Mulgedium hastatum* Less. Synops. Compos. (1832) 142.

This species should be excluded from the Flora of the USSR. For details, see V.L. Komorov, *Fl. P-va Kamchatki* [Flora of Kamchatka Peninsula] III, 1930, p. 207, and in E. Hultén [Fl. of Kamtchatka and the adjacent Islands IV (1930) 232].

GENUS 1654. *Lactuca* L.^{1,2}

L. Sp. pl. (1753) 795; DC. Prodr. VII, 1 (1838) 133; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 524, p. p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 371, p. p.

¹ Treatment by M.E. Kirpicznikov.

² From the Latin word *lac*—milk; the name indicates the presence of milky latex in the plants.

Capitula homogamous, with (9)10–20(27) florets, small (up to (5)9–14(20) mm long at fruiting), usually narrow-cylindrical, oblong, truncate-turbinate or campanulate, sometimes constricted near middle or base, in paniculate, corymbose- or racemose-paniculate or, less often, spicate inflorescence. Involucral bracts herbaceous, imbricate, three- or four-rowed; inner bracts several times as long as outer ones, usually scarious along border. Receptacle smooth. Corolla yellow, less often light blue, blue, lilac or pink. Achenes more or less flattened to flat, narrow-obovoid, oblong-ellipsoid, oblong, oblong-linear, oblong-ellipsoid or ellipsoid, differently colored (brown of various shades, dark violet, blackish and other shades), with one to many or somewhat numerous prominent longitudinal ribs, often slightly rugose due to short hairs in transversely undulate rows (under a hand lens!), terminating into long filiform beak, differing in color and structure from rest of achene, or upper part narrowed in thin beak-like structure, colored like rest of achene; less often achene apex narrowed into somewhat thick crown or not; pappus bearing disk wide, usually equaling broadest part of achene or slightly broader; pappus of white, less often somewhat dirty or rusty thin hairs, usually falling singly, less often more or less firmly attached to disk.

Annual, biennial and perennial herbs, less often semi-shrubs, inhabiting the forest zone and mountains, as well as more or less arid steppes, semideserts and deserts on soils with various degree of salinity.

Lectotype of genus: *Lactuca sativa* L.

The genus includes 100–150 species, a large number of them distributed in Asia; many occur in the Mediterranean countries and tropical Africa; relatively few species are found in North America, and only a few have been reported from Central America.

Note. For the sake of practical convenience, we are adopting a quite broad concept of the genus *Lactuca*. In the context of the present approach to phylogeny, it probably would be more appropriate to consider the four subgenera as separate genera.

1. Rhizome slender, creeping, terminating in slender and short vanishing stem up to 8–15 cm high including leaves; leaves two to few, on more or less long (usually about 5 cm) petioles; capitula in ones and twos, less often a few, on axillary peduncles. Plants endemic to Talass Alatau 20. **L. mira** Pavl.
- + Plants without creeping rhizome, or leaves many, and capitula not axillary 2.
2. Achenes flat, ellipsoid or oblong-ellipsoid, 2–2.5 mm wide in broadest part, less often 1.5 mm, almost black or dark violet; aerial parts of plant with narrow-fusiform tuberos thickenings. Within

- the USSR, plants growing only in the Far East, less often also in Eastern Siberia. 3.
- + Achenes usually flattened, up to 1 mm wide, less often to 1.5 mm, differently colored; aerial parts of plant without narrow-fusiform tuberos thickenings 5.
3. Achenes with very short but distinct beak; capitula with 20–25 florets, 13–15 mm long at fruiting 7. **L. indica** L.
- + Achenes with very short, somewhat broad neck, but without distinct beak; capitula with 10–15 florets, 10 mm long at fruiting 4.
- 276 4. Achenes with few prominent longitudinal ribs on each side; leaves on both sides and along margin (under a lens!) with short squamiform hairs, most distinct along veins beneath, unevenly spinose-toothed along margin and usually with narrow reddish frill; stem rather densely covered with narrow squamiform hairs up to point of forking 9. **L. raddeana** Maxim.
- + Achenes with single, rarely two prominent longitudinal ribs on each side; leaves usually with dense, narrow, pale, squamiform hairs (under a hand lens!) sometimes above and along unevenly spinose-toothed margin 8. **L. triangulata** Maxim.
- 5(2) Beak or narrow beak-like part more or less as long as achene or longer, usually filiform and almost always differently colored than body of achene 6.
- + Beak (or narrowed beak-like part) half as long as achene or slightly longer, usually concolorous with body of achene; sometimes achenes without beak 15.
6. Beak colored like whole achene. Plants rather large (50–130 cm high), with undivided, thick (almost coriaceous), elliptical or oblong-obovate leaves, punctate beneath. Plants growing in Badkhyz and Kugitang 19. **L. spinidens** Nevski
- + Beak differently colored than achene. or more or less colorless. Plants smaller or leaves different 7.
7. Base of beak with two pendent rod-shaped appendages (deliquescent in water!) at achene apex; as a result beak appears to lie on top of achene; beak three to four times as long as achene. Annual, distributed all over Soviet Central Asia, as well as southern Transcaucasia and Western Siberia 18. **L. undulata** Ldb.
- + Base of beak without rod-shaped appendages; beak arising from achene apex or upper neck-like part of achene 8.
8. Achene terminating in roundish notch where conically thickened base of beak originates, narrowed above into filiform structure; achenes usually with three longitudinal ribs on each side. Annual. Plants of Soviet Central Asia (almost exclusively in Tien Shan and Pamiro-Alai districts) 17. **L. auriculata** DC.

- + Achene not terminating in roundish notch; base of beak without conical thickening; achenes with one or many (five-seven-nine or more) longitudinal ribs on each side 9.
- 277 9. Short annual plants, (2)7–15(20) cm high; basal leaves in rosette, with rather long, crisped or flexuous, light colored hairs beneath; achenes light colored (yellowish or dark brownish-yellow) with single prominent rib in middle on each side. Plants of Soviet Central Asia 16. **L. glauciifolia** Boiss.
- + Plants taller, or leaves without crisped hairs beneath, and achenes of different color 10.
10. Achenes with single prominent rib in middle on ventral and dorsal sides, dark or blackish-brown, almost entirely glabrous (rather short hairs visible only under high magnification). Short (10–25 cm high), biennial or perennial plants, rarely found (within the USSR, so far known only from the western part of the Kara-Kum District) 15. **L. rosularis** Boiss.
- + Achenes with more or less numerous prominent longitudinal ribs on each side 11.
11. Achenes about 1.5 mm wide (in broadest part), dark violet to almost black, abruptly narrowed at apex into about 1 mm-long narrow part (neck) bearing filiform beak almost as long as achene; pappus readily detached. Stem up to 7–10 mm thick at base, fistular 14 **L. georgica** Grossh.
- + Achenes narrower, or their beak longer 12.
12. Achenes, including the upper part, covered with fine, very short, upward-directed, stiff hairs (under a hand lens!); capitula borne singly on slender, virgate branches in lax spicate racemes; peduncles slender, short or almost undeveloped, and then capitula subsessile or sessile; beak usually one and one-half to two times as long as achene. Plants from the European part of the USSR and Caucasus 12. **L. saligna** L.
- + Achenes in upper part covered with more or less soft, often squarrose, transparent hairs (under a lens!) 13.
13. Lower leaves undivided, rotund-obovate or elliptical, sometimes sinuate; achenes usually gray (less often dark or light brown), about 4 mm long and 0.8–1 mm wide; pappus almost as long as achene and more or less firmly attached. A universally cultivated plant, but sometimes growing in the wild 11. **L. sativa** L.
- + Lower leaves variously divided (runcinately pinnatisect, pinnatipartite, pinnatifid, erose-pinnatipartite or pinnatilobate), if entire, then lanceolate 14.
- 278 14. Lower and middle cauline leaves usually runcinate, completely surrounding stem (in clear weather held vertically in sunny places);

- peduncles usually longer than capitula; beak slightly longer or one and one-half to two times as long as achene; pappus about 6 mm long, of not always deciduous hairs. Plants widely distributed in the European part of the USSR, all districts of Caucasus and Soviet Central Asia, as also in Siberia 10. **L. serriola** Torner
- + Lower leaves usually runcinate, or lower and middle cauline leaves lanceolate and lanceolate-linear to linear and (very rarely) oblong; peduncles usually short, as a result, capitula often sessile or even sessile; beak more or less as long as achene, sometimes distinctly longer; pappus about 5 mm long, of rather readily detached hairs. Plants of southern part of Volga Region, Caucasus, Western Siberia, and Soviet Central Asia 13. **L. altaica** Fisch. and Mey.
- 15(5) Corolla yellow; achenes dark violet to almost black with concolorous upper beak-like part, half (or slightly more) as long as achene 18.
- + Corolla blue or light blue (but color of *Lactuca winkleri* unknown); achenes usually light colored (yellowish-brown, olive colored, etc.), less often blackish 16.
16. Achenes yellow or sand-colored, with dark brown annulus at apex, densely covered with short, light-colored hairs throughout (under a lens!); pappus hairs very readily detached. Plants endemic to Pamiro-Alai 3. **L. winkleri** Kirp.
- + Achenes dark, with indistinct annulus, wholly covered with short hairs, usually arranged in transverse-sinuate rows (under a lens!); pappus hairs more or less readily detached 17.
17. Longitudinal ribs in middle; as a result, relatively thick margins of achenes stand out; beak-like narrowing either not developed, or one-fourth as long as achene (very rarely longer); cauline leaves usually with broad amplexicaul base, thin 1. **L. sibirica** (L.) Benth. ex Maxim.
- + Longitudinal ribs more or less uniformly distributed on achene; beak-like narrowing often (especially in upper part) lighter-colored, usually one-third to half as long as achene; cauline leaves often narrowed toward base, usually stiff and thickish. 2. **L. tatarica** (L.) C.A. Mey.
- 18(15) Middle cauline leaves entire or subentire 5. **L. chaixii** Vill.
- 279 + Middle cauline leaves pinnatifid or pinnatisect, 19.
19. Achenes with five or more prominent longitudinal ribs on each side, gradually narrowed toward apex into about 3 mm-long beak; segments of leaves usually narrow-triangular or linear-lanceolate; roots usually tuberous 6. **L. wilhelmsii** Fisch. and Mey.

- + Achenes with two or three, less often more (but usually not more than five), prominent longitudinal ribs on each side; narrowed toward apex into about 2 mm-long beak; segments or lobes of leaves mostly oblong or ovate-lanceolate; roots usually not tuberous 4. **L. stricta** Waldst. and Kit.

Subgenus 1. *Mulgedium* (Cass.) Babcock, Stebbins and Jenkins in Cytologia, Fujii Jubil. vol. (1937) 190 p. min. p. —*Mulgedium* Cass. in Diet. sc. nat. XXXIII (1824) 296 and XLVIII (1827) 426, p. p.—*Agathyrus* D. Don in Edinb. New Phil. Journ. VI (1829) 310 p. p.—*Mulgedium* sect. 1. *Eumulgedium* DC. Prodr. VII, 1 (1838) 248, p. min. p. —*Lactuca* sect. 4. *Cicerbita* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 525, p. min. p.—*Mulgedium* sect. I. *Lactucopsis* (Sch. Bip.) Boiss. Fl. or. III (1875) 799.—*Lactuca* sect. *Mulgedium* Clarke, Compos. Ind. (1876) 260, p. p.—*Cicerbita* § 1. *Mulgedium* Beauverd in Bull. Soc. Genève, 2 Ser. II (1910) 116 (seorsum impressum: Contrib. a. l'étude des Compos. III, p. 18).—*Lactuca* sect. *Lactucopsis* Kitam. in Acta Phytotax. et Geobot. XI, 2 (1942) 125.—*Lagedium* Soják in Novit. bot. Horti bot. Univ. Car. Prag. (1961) 34.—Achenes slightly flattened, yellowish-brown to dark olive and black, with few or more or less numerous prominent longitudinal ribs on each side, rather densely covered with very short, stiff, upward-directed hairs (under a hand lens!); achene apex attenuate into more or less distinct neck (sometimes rather thin and then looking like beak), concolorous with achene, or (less often) slightly lighter-colored; collar usually one-eighth to one-fourth as long as achene, less often up to half and more but, in some cases, neck almost not developed, and then achene apex directly modified into pappus-bearing disk; pappus of dirty white or dirty yellow, less often rusty or pure white hairs, falling individually; corolla light blue, blue, or lilac. Perennial, mostly weeds or semi-weeds, usually with strongly developed root system and rhizomes.

Type of subgenus: *Lactuca tatarica* (L.) C.A. Mey.

- 280 **Note.** This characterization of the subgenus is quite tentative, as it is based on the analysis of characters of only the local members of this taxon (the scope of the subgenus *Mulgedium* as a whole is not yet definite).

1. **L. sibirica** (L.) Benbh. ex Maxim. in Bull. Acad. Sc. Pétersb. XIX (1874) 528; Schmalh. Pl. II, 166; Kitag. in Report Inst. Sc. Res. Manch. III, App. 1, 456 (Lineam. fl. Manshur.); Sugaw. Ill. fl. Saghal. IV, 1927; Kryl. Fl. Zap. Sib. XI (1949) 3024 (incl. var. *integrifolia* (Ldb.) Serg. and var. *dentata* (Ldb.) Serg. op. cit. p. 3025); Sobolevskaya, Konsp. Fl. Tuvy 201; Grubov. Konsp. Fl. MNR 282, No. 1857 (Tr. Mong. Kom. Vysh. 67); Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1, 134 (Compos. Jap. V); Karav. Konsp. Fl. Yakutii 178.—*Sonchus sibiricus* L.

Sp. pl. (1753) 795; Ldb. Fl. Alt. IV (1833) 140 (incl. *α. integrifolius* Ldb. and *β. dentatus* Ldb. op cit. p. 141).—*Mulgedium runcinatum* Cass. in Dict. sc. nat. XXXIII (1824) 296, p. p.—*Agathysus sibiricus* D. Don in Edinb. New Phil. Journ. VI (1829) 310.—*Mulgedium sibiricum* Cass. ex Less. Synops. Compos. (1832) 142; DC. Prodr. VII, 1 (1838) 249 (excl. *β. indivisum* DC. ibid); Ldb. Fl. Ross. II, 2 (1845–1846) 844 (incl. *α. integrifolium* Ldb. and *β. dentatum* Ldb.); Turcz. in Bull. Soc. Nat. Mosc. XXI, 3, 124 (Fl. baic.-dahur. II, No. 721); Maxim. in Mém. Acad. Pétersb. div. sav. IX, 182 (Primit. Fl. Amur. No. 466); Rgl. in Mém. Acad. Pétersb. sér. VII, 4, 98 (Tentam. Fl. Ussur. No 4. 311, errore sub *Mulgedio sibirico* L.); Kom. in Tr. Peterb. Bot. Sada XXV, 773 (Fl. Man'chzh. III, No. 1643); Fedtsch. and Fler. Fl. Evrop. Ross. 1055; O. and B. Fedtsch. Perech. Rast Turk. IV, 351 (Consp. Fl. Turk. No. 2859); Lindem. Svensk fanerogam. fl. Andra uppl. 559; Kom. Fl. P-va Kamchatki III, 187; Hult. in Kungl. Sv. Vet. Akad. Handl. Ser. 3, Bd. 8, 2, 229 (Fl. of Kamtch. IV, No. 777); Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II, 1097; Hiit. Suom. Kasv. 728; Kraschen. in Fl. Yugo-Vost. VI, 464; Perf. Fl. Sev. Kraya II–III, 374; Leskov. Fl. Malozem. Tundry, 103 (Tr. Sev. Bazy Akad. Nauk SSSR, Vyp. 2); Govorukhln, Fl. Urala 521; Kirp. in Majeviski, Fl. (1954) 630; Vorobev in Tr. Dal'nevost. Fil. Ser. Bot. III (V) 77 (Materialy k Fl. Kuril'skikh o-vov, No. 976); Stank. and Tal. Opred. Vyssh. Rast. (1957) 442; Popov, Fl. Sr. Sib. II, 787.—*Mulgedium kamschaticum* Ldb. in Denkschr. Königl.-Bayer. Bot. Gesellsch. Regensb. III (1841) 65 (Commentarius in J.G. Gmelini Floram sibiricam); id. Fl. Ross. II, 2, 845.—*Sonchus maritimus* Pall. ex Ldb. Fl. Ross. II, 2 (1845–1846) 843.—*Lagedium sibirium* Soják in Novit. bot. Horti bot. Univ. Car. Prag. (1961) 34.—*lc.*: J.G. Gmel. Fl. Sibir. II (1749), t. III, fig. A and B; Schkuhr, Bot. Handb. III (1803), t. CCXVII (color., mediocr.); Sugaw. l. c. t. 887.—*Exs.*: Herb. Fl. Ingr. No. 366; GRF No. 1229 (utroque casu sub *Mulgedio sibirico*).

- 281 Perennial. Rhizomes mostly vertical, sometimes branched. Stem (10)30–70(110) cm high, usually solitary, almost smooth or weakly sulcate to ribbed, glabrous, often reddish, rather densely and uniformly leafy (fully developed leaves reaching, at least, base of common inflorescence), more or less branched in upper part. Leaves lanceolate or oblong-lanceolate, acute, sessile; lower leaves basally narrowed, others with semiamplexicaul or almost amplexicaul, cordate, cordate-auriculate or sagittate base; lamina green above, glaucous-green beneath, entire or subentire, with narrow bent down frill (var. *integrifolia* (Ldb.) Serg.), or from weakly emarginate-toothed to more or less strongly pinnatifid or even runcinate (var. *dentata* (Ldb.) Serg.), lobes (parts or segments) often falcate. Capitula with about 20 florets, globose turbinate or campanulate, 9–13 mm long with fruits, in lax corymbose or corymbose-paniculate inflorescence; peduncles

slender, glabrous, usually longer than capitula. Involucral bracts three- or (less often) four-rowed, often purple, lilac or mottled (with dark spots), with very fine, dense, appressed pubescence on dorsal surface (under a hand lens!), inner bracts subobtusate, often with frill of thin, light-colored hairs. Corolla blue or light blue (very rarely white—albino). Achenes 4–5 mm long and 1–1.25 mm wide, oblong-linear or elliptical, somewhat flat, yellowish-brown to dark olive or blackish, with few, prominent, longitudinal ribs in middle or achene, rather densely covered with very short, light-colored, stiff hairs (under high magnification!), and, sometimes, also with few, rather long, white hairs at base; achenes narrowed above into more or less distinct neck, usually, not exceeding one-fourth of achene length and terminating in funnel-shaped broadening with roundish or four- or five- obtusely-angled disk; pappus of numerous, thin, dirty white or rusty (in rare cases pure white) hairs, weakly but quite frequently toothed (under a hand lens!), 5–7 mm long, slightly connate at base or free, in both cases easily detached from disk. Flowering June to July. (Plate XVI, Fig. 3.)

Semiweeds, widely distributed in forest region, found in forest and floodplain meadows, thickets of willows and shrubs along forest edges on logged areas and burns, in forests (especially open forests), near irrigation channels and marshes (less often in marshes), as well as along old fields and wastelands and sometimes in cultivated fields; much less often found in steppe region, mostly near forest islands, on meadows, sometimes in thickets of wormwood or other nonforested herb or herb-shrub communities.—*Arctic*: Arctic Europe, Chukotka! (rarely!); *European Part*: Karelia-Lapland (south), Dvina-Pechora, Baltic Region (very rarely), Ladoga-Ilmen, Upper Volga (rarely!), Volga-Kama, ?Middle Dnieper (one sheet from vicinity of Ternopol), Trans-Volga Region (rarely!); *Western Siberia*: all regions; *Eastern Siberia*: all regions; *Far East*: all regions; *Soviet Central Asia*: ?Dzhungaria-Tarbagtai (one doubtful sheet from Kopal Mountain). *General distribution*: Scandinavia, Mongolia, Japan and
282 China, ?North America (continually reported earlier; not seen in herbarium, and did not find precise information in more recent publications).—Described from Siberia and Scandinavia (“Sibiria, Suecia, Finlandia”). Type in London.

Note. A species that varies relatively little, apparently with a few ecological races. To date there is almost no precise information available on the morphology of the underground parts of the plants.

Komarov (Fl. Poluostrova Kamchatki [Flora of Kamchatka Peninsula] III, 1930, p. 187) included “*Youngia sibirica* Erman Verz. 48” among the synonyms of *Mulgedium sibiricum*. I did not find this name in the publications of Erman, and it is also not mentioned in *Index Kewensis*, or in the work of Hultén on the Flora of Kamchatka. Erman listed only

Sonchus sibiricus L. (cf.: Erman, Reise, Naturhist. Atlas (Verzeichn. etc.) 1835, p. 57).

Economic Importance. It has some fodder value (cf. Larin et al. Kormovye Rast. Senokosov i Pastbishch SSSR [Fodder Plants of the Grasslands and Pastures of the USSR], Vol. III, Sel'khozgiz, Moscow-Leningrad, 1956, p. 677).

2. **L. tatarica** (L.) C.A. Mey. Verzeichn. Pfl. Cauc. (1831) 56, Schmalh. Fl. II, 166; Grossh. Fl. Kavk. IV (1934) 255 and Opred. Rast. Kavk. 515; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 186; Kryl. Fl. Zap. Sib. XI (1949) 3023 (incl. var. *glabra*, and var. *floccosa* Serg.); Schchian in Fl. Gruzil VIII, 683; Sobolevskaya, Konsp. Fl. Tuvy 201; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2, 1130; Grubov. Konsp. Fl. MNR 283, No. 1858 (Tr. Mong. Kom Vyp. 67); Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 431 (Fl. of Afghanistan, 1960); Vvedensky. et al. Opred. Rast. Golodnoi Step'i (40 Tr. Tashk. Gos. Univ.; Vyp. 178, Bot.); Askerova in Fl. Azerb. VIII, 552; Kovalevskaja in Fl. Uzb. VI, 489.—*Sonchus tataricus* L. Mant. II (1771) 572.—*Mulgedium runcinatum* Cass. in Dict. sc. nat. XXXIII (1824) 296, p. p.—*Agathyrus tataricus* D. Don in Edinb. New Phil. Journ. VI (1829) 310; Klok. in Vizn. Rosl. URSR, 603.—*Sonchus maritimus* auct. non. L.: Claus in Goebel, Reise II (1838) 284 (fide Ldb. 1. c., v. infra).—*Mulgedium tataricum* DC. Prodr. VII, I (1938) 248; Ldb. Fl. Ross. II, 2, 842; Boiss. Fl. or. III, 799; Fedtsch and Fler. Fl. Evrop. Ross. 1055; O. and B. Fedtsch. Perech. Rast. Turk. IV, 350 (Consp. Fl. Turk. No. 2857); Navski in Sornye Rast SSSR IV, 339; Perf. Fl. Sev. Kraya II–III, 375; Kraschen. in Fl. Yugo-Vost. VI, 464; Govorukhin, Fl. Urala 521; Pavlov, Fl. Tsent. Kazakhst. III, 361; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 104; Kirp. in Majeviski, Fl. (1954) 630; Popov, Fl. Sr. Sib. II, 786; Nikitina, Mater. po Fl. Sev. Skl. Kirg. Ala-too 110, No. 1126.—*M. tataricum* α . *typicum* β . *floccosum* and γ . *integrum* Rgl. in Bull. Soc. Nat. Mosc. XI, II, 3 (1867) 181; O. and B. Fedtsch. op. cit. 361.—*M. tataricum* β . *subfloccosum* Rgl. in Tr. Peterb Bot. Sada I, 2 (1872) 255.—*M. tataricum* var. *anomalum* Korsh. in Mém. Acad. Sc. Pétersb. VIII sér. VII, 1 (1898) 264 (Tentam. Fl. Ross. or. No. 776).—*M. tataricum* f. *pumilum* B. Fedtsch. in Mat. Fl. Pam i Alaïsk. Khr. (1900) 8 (Prilozh. 283 from "Zemlevedeniye", Kn. 1); O. and B. Fedtsch. op. cit. 351.—*Cicerbita tatarica* Beauverd ex Sosn. in Takht. and Fed. Fl. Erevana (1945) 338.—*Lagedium tataricum* Soják in Novit. bot. Horti bot. Univ. Car. Prag. (1961) 34.—**Ис.**: Nevski. op. cit. 340, Fig. 492; Kraschen. op. cit. 465, Fig. 720; Hegi, op. cit. 1131, Fig. 807—**Exs.**: Lang and Szovitz, Herb. ruth. No. 144 (sub *Soncho tatarico*) Callier, Iter Taur. tert. (1900) No. 664 (sub *Mulgedio tatarico*).

Perennial. Plants with strong root system and vertical or slightly twisted rhizomes underground, producing aerial shoots. Stem (5)30–80(100) cm, according to published reports up to 190 cm high, slightly sulcate, glabrous or sometimes partly tomentose, or with isolated hairs, branched usually only above, or, less often, more or less throughout. Leaves approximate in lower part of stem, glaucous or light glaucous, rather thick, fleshy, but somewhat stiff, narrowed toward base; lower leaves amplexicaul, petiolate, pinnatisect or runcinate, with narrow, deflexed, usually acuminate lobes, sparsely spinulose along margin; middle leaves like lower leaves (but smaller) or undivided, lanceolate; upper leaves sessile or subsessile, undivided lanceolate, or narrow-lanceolate; very rarely all leaves undivided. Capitula with about 20(16-23) florets, cylindrical or truncate-turbinate, 11–14(20) mm long with fruits, in paniculate inflorescence, on unequal peduncles, covered with small, scaly leaves. Involucral bracts usually four-rowed, very finely pubescent on outer surface, often slightly violet; inner bracts with membranous, usually sinuate border, subobtus. Corolla lilac-blue or blue. Achenes 5.5–6 mm long and 0.75–1 mm wide, oblong-linear or ellipsoid, slightly appressed, yellowish-brown to dark olive or almost black, with five to seven prominent longitudinal ribs, rather densely covered with very short stiff hairs (under high magnification!), gradually attenuate at apex into beak-like structure, usually lighter colored than and one-third to half as long as achene, terminating in funnel-shaped disk bearing pappus of thin, white or dirty yellowish, soft and lustrous, almost smooth and rather fragile hairs, one and one-half to two times as long as achene. Flowering May to July(September); fruiting June to September. (Plate XVI, Fig. 4.)

On clayey and sandy soils (including saline lands), on steep river banks, banks of water bodies (rivers, lakes, irrigation channels, near wells), coastal sands; from zone of mixed forests to deserts, but particularly in the southern steppes and semideserts; mountains up to 3,400 m; as a weed in fields of different cultivated crops, fallow land, kitchen gardens, melon fields, orchards and in forest protection zones, as well as on irrigated lands, in oases and near springs; often in large clusters (patches) all over.—*European Part*: Dvina-Pechora (western part, less often) Ladoga-Ilmen (very rarely, one specimen seen from vicinity of Ostrov), Upper Volga (less often), Volga-Kama (mainly southern part of western half), Volga-Don (less often), Trans-Volga Region (commonly), Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga (commonly); *Caucasus*: all regions; *Western? Siberia*: Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-Sayans; *Soviet Central Asia*: all regions. *General distribution*: central Europe, Atlantic Europe, Balkans-Asia Minor, Iran Region (Afghanistan), ?Indo-Himalayas (northern India, literature records), Dzhungaria-Kashgaria, Mongolia, China, ?Tibet

(literature records). Also reported from Scandinavia (cf. Lindeman, Svensk fanerogamflora, Andra uppl. (1926) 559), but this is very doubtful. Described by Linnaeus from "Tartaria" and Siberia. Type in London.

Note. *L. tatarica* is not uniform throughout its urde range; however, the variations are not important enough to warrant a higher rank than form or modification. First of all, let us take the achene. It has been reported in the literature that almost beakless forms (f. *pumilum* B. Fedtsch.) are found in *L. tatarica*. But the achenes are always underdeveloped in stunted plants of *L. tatarica* growing under extreme or generally unfavorable conditions, and in this species there is a general tendency toward suppressed reproduction from seeds. On the basis of this character S. Korshinsky described the new var. *anomala* Korsh. for the extensive material in which it was impossible to find developed achenes. The usually cited difference in the achenes of *L. tatarica* and *L. sibirica* is extremely undependable; quite often, the beak in the former species is not any longer than in the latter. These two species are distinguished better on the basis of their vegetative characters and biology and also by the length of the corolla tube, which is about 4 mm in *L. sibirica* and usually 6 mm in *L. tatarica*.

The vegetative organs of *L. tatarica* differ slightly in their pubescence, but may have larger differences in size, consistency, and shape of leaves. It is quite apparent that the leaves of many Central Asian plants are strongly glaucous and extremely stiff. The plants collected from the Caspian lowlands, Balkhash Region, vicinity of Panfilov, and, especially, the Kyzyl-Orda District are characterized by very long (in individual cases up to 35 cm), linear-lanceolate or linear cauline leaves. *L. tatarica* from these places needs special attention; it would be particularly important to study the biology of the Mediterranean representatives in comparison with their ancestral types, which are distributed more to the west and north.

Economic Importance. Tatar lettuce is one of the pernicious and difficult-to-eradicate, sucker-producing weeds. It usually reproduces vegetatively through numerous adventitious buds on the roots and regenerating buds on the rhizomes. It has a strong root system with the tap root reaching a length of up to 1 m in annuals, and 4–5 m in adult perennials. Large, more or less horizontal roots arise from the main root (called propagation roots, as most of the buds are particularly concentrated on them). A single plant of *L. tatarica* can produce more than 50 aerial shoots in a single vegetative period. Control measures for this weed include, besides the use of herbicides (to which it is fairly resistant, owing to the thick cuticle on the leaves), a whole system of agronomic practices. For details about the biology of this plant, cf. *Sornye Rasteniya SSSR* [Weeds of the USSR] (Vol. IV, Acad. Nauk SSSR,

Moscow-Leningrad, 1935), and especially the article by A.M. Bilova, "Moloken tatarskii" [Tatar lettuce] (in *Biology of Weeds*. Handbook for Teachers, Uchpedgiz, Moscow, 1960). Moreover, *L. tatarica* is of major importance as a fodder plant, although it is poisonous in large quantity (for details, refer to the book by Larin et al., *Kormovye Rast. Senokosov i Pastbishch SSSR* [Fodder Plants of Grasslands and Pastures of the USSR], Vol. III, Sel'khozgiz, Moscow-Leningrad, 1956, 678 p.)

3. *L. winkleri* Kirp. nom. nov.—*Mulgedium longifolium* C. Winkl. in Tr. Peterb. Bot. Sada, XI, 10 (1890) 337 (serosum impressum; in volumino completo XI, 2 (1892) 337); O. and B. Fedtsch. Perech. Rast. Turk. IV, 351 (Consp. Fl. Turk. No. 2858); Zakirov, Fl. i Rastit. Bass. Zeravsh. II, 426.

Perennial. Roots ? Stem 60–100 cm high, solitary, fistular, distinctly but shallowly sulcate, glabrous or subglabrous, sparsely leafy, weakly branched above (sometimes from middle). Leaves broadly or oblong-linear to lanceolate, gradually reduced toward apex, broadly but finely erose along margin, unevenly toothed-spinose; lower and middle cauline leaves basally narrowed into winged petiole, semiamplexicaul, usually with prominent thick midrib, usually entire or sometimes more or less runcinate; upper cauline leaves sessile or subsessile, semiamplexicaul; peduncular leaves reduced, scaly. Capitula of about 15 florets, almost cylindrical or slightly broadened above, up to 15 mm long with fruits, in lax panicles or racemose-paniculate inflorescence; peduncles usually shorter than capitula. Involucral bracts usually three-rowed, with very thin and dense appressed pubescence on dorsal surface (under a lens!), somewhat squarrose. Corolla?. Achenes about 4.5 mm long and 0.8 mm wide, oblong-ellipsoid, slightly flattened, yellowish or sand-colored, with prominent longitudinal ribs, densely covered with very short light-colored hairs (under high magnification!), slightly narrowed in upper part, without distinct beak, terminating in narrow disk bearing pappus; pappus of numerous, very thin, silky, snow-white hairs, almost smooth (poorly developed barbs detected only under high magnification), slightly curved at base, easily detached individually, up to 7–9 long. Flowering September. (Plate XVI, Fig. 1.)

In upper mountain zone ("tau"); shady habitats; on clayey-sandy, moist soil and wet stony places.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from the Alai Valley (Bolshoi Karamuk) on the basis of collections of Nevski. Type and isotypes in Leningrad.

Note. Described entirely from only three (albeit authentic) specimens collected without the lower part. According to K. Winkler, who described this species, it is closely related to *L. tatarica*, from which it differs by

having a beakless achene (almost the same as achenes of *Sonchus*), leaves almost two times as long, and a much taller stem.

After transfer from the genus *Mulgedium* to the genus *Lactuca*, it is not possible to retain the epithet "longifolium." as *Lactuca longifolia* Michx. (1803) and *L. longifolia* DC. (1838) already exist.

Subgenus 2. *Lactucopsis* (Sch. Bip.) Babcock, Stebbins and Jenkins in *Cytologia*, Fujii Jubil, vol. (1937) 191 p. p.—*Lactucopsis* Sch. Bip. in Vis, and Panč. in Mém. Reale Inst. Veneto, XV (1870) 5 (P1. Serb. rar. III).—*Lactuca* sect. 4. *Cicerbita* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 525, p. min. p.—*Lactuca* § 2. *Scariolae* **Biennes* Boiss. Fl. or. III (1875) 804, p. p.—*Cicerbita* § 2. *Lactucopsis* Beauverd in Buil. Soc. Bot. Genève, 2 Sér. II (1910) 116 (seorsum impressum. Contrib. a l'étude des Compos. III, p. 18).—Achenes flattened, almost black, oblong-ellipsoid, with two to five strongly raised longitudinal ribs on each side, covered with stiff upward-directed hairs (under a lens!). Particularly noticeable along sides of upper narrowed part as well as by transverse sinuate rows of very short outgrowths or hairs (under high magnification!); achene apex attenuate, beak-like, concolorous with remaining part; pappus of white, rather thin, usually very fragile hairs. Corolla yellow.

Mostly biennial plants with thick or often furcate root, growing in forest-steppe and steppe zones as well as in mountains (up to middle mountain zone) and forests, on forest edges and in thickets of shrubs.

The beak in typical members of *Lactuca* is a unique morphological structure, whereas the so-called beak in the members of the subgenus *Lactucopsis* is simply the greatly extended upper part of achene.

Type of subgenus: *Lactuca chaixii* Vill.

- 288 4. ***L. stricta*** Waldst. and Kit. Descr. et ic. pl. rar. Hungar. I (1802) 47; DC. Prodr. VII, 1, 138; Boiss. Fl. or. III (1875) 808 (incl. *β. armena* Boiss.) Grossh. Fl. Kavk. IV (1934) 256 and Opred. Rast. Kavk. 516; Klok. in Vizn. Rosl. URSR, 604; Szafer, Kulcz., B. Pawl. Rośl. Polsk. (1953) 774; Stank. and Tal. Opred. Vyssh. Rast. (1957) 444. —*Cicerbita corymbosa* Wallr. Sched. crit. I (1822) 434.—*Lactuca stricta* Waldst. and Kit. *β. runcinata* and *γ. heterophylla* Bogenh. Taschenb. Fl. Jena (1850) 269. —*L. quercina* *α. pinnatifida* Bisch. Beitr. z. Fl. Deutschl. Cichorieen (1851) 205.—*L. quercina* L. *α. typica* Fiori Nuova Fl. analit. Ital. II (1925) 825. —*L. quercina* L. ssp. *stricta* (Waldst. and Kit.) Hayek in Hegi, III. Fl. VI, 2 (1928) 1128; Dostál, Kléč (1954) 802.—*L. quercina* auct. fl. Ross. p. p. non L.: Ldb. Fl. Ross. II, 2 (1954) 806; Schmalh. Fl. II, 168; Fedtsch. and Fler. Fl. Evrop. Ross. 1059.—**lc.**: Waldst. and Kit. op. cit. t. 48 (color., bona); Dostál, op. cit. 799, fig. 2220.



- 1—*Lactuca altaica* Fisch. and Mey., habit of plant and achene; 2—*L. serriola* Torner, achene; 3—*L. sativa* L., achene; 4—*L. auriculata* DC., achene; 5—*L. undulata* Ldb., achene; 6—*L. rosularis* Boiss., achene; 7—*L. georgica* Grossh., achene; 8—*L. saligna* L., achene; 9—*L. glaucifolia* Boiss., achene; 10—*L. spinidens* Nevski, achene.

Biennial. Root often furcate. Stem (50)80–150(200) cm high, weakly sulcate, smooth or almost smooth. Leaves glabrous or (especially beneath) slightly appressed-hairy; lower leaves early-withering, lyrate-pinnatisect, with large apical ovate segment, narrow-winged, semiamplexicaul, with petiole expanded at base; middle leaves sessile, auriculate-sagittate at base, pinnatipartite or pinnatisect with oblong, ovate, or linear-lanceolate, or irregular-in-shape, more or less coarse-toothed lobes or segments; upper leaves strongly reduced, narrowly triangular or linear, entire, acuminate, reduced in inflorescence. Capitula of about 10 florets, cylindrical or almost cylindrical, (10)11–13(14) mm long with fruits, in somewhat lax corymbose-paniculate inflorescence; peduncles slender, usually longer than capitulum, with few reduced leaves resembling involucre bracts. Involucre usually three-rowed, bracts slightly appressed-hairy (under a lens!), longest bracts (inner) with membranous border, sometimes with more or less numerous red spots along dorsal surface. Corolla yellow. Achenes (excluding beak-like part) about 5 mm long and 1.25 mm wide, oblong-ellipsoid, flattened, dark violet or blackish, with (two) five prominent-longitudinal ribs on each side and transverse sinuate rows of light-colored membranous outgrowths and hairs and distinct (under magnification!) stiff, upward-directed hairs along sides of upper attenuate part of achene, near its transition to thin, black, beak-like constriction, latter 2–2.5 mm long, terminating in disk bearing pappus of fine, white, silky, almost smooth (under high magnification, slightly barbed), about 5 mm-long, fragile hairs falling individually. Flowering June to November. (Plate XVII, Fig. 3.).

289 Deciduous forests and forest edges —*European Part*: Middle Dnieper, Bessarabia, Black Sea Region, Crimea; *Caucasus*: ?Ciscaucasia. *General distribution*: Scandinavia, central Europe, western Mediterranean, Balkans, Asia Minor. Described from Hungary. Type, apparently, in Budapest.

Economic Importance. The milky latex from the stems of *L. stricta*, the so-called lactucarium, which, hardens when exposed to the air, contains the somniferous substance lactucerin, which has an effect similar to opium.

5. *L. chaixii* Vill. Prosp. hist. pl. Dauph. (1779) 33 (non vidi!); Ej. Hist. pl. Dauph. III (1789) 154; DC. Prodr. VII, 1, 138 (ut species dubia); Grossh. Fl. Kavk. IV (1934) 256 and Opred. Rast. Kavk. 516; Klok. in vizn. Rosl. URSR 604; Schchian in Fl. Gruzii VIII, 684, Stank. and Tal. Opred Vyssh. Rast. (1957) 443.—*Lactuca sagittata* Waldst. and Kit. Descr. et ic. pl. rar. Hungar. I (1802) 1; DC. Prodr. VII, 1, 136; Ldb. Fl. Ross. II, 2, 804; Boiss. Fl. or: III, 807; Kraschen, in Fl. Yugo-Vost. VI, 471.—*Prenanthes altissima* Pall. Reise III (1776) 655 nomen.—*Lactuca altissima* M.B. Fl. taur.-cauc. II (1808) 242 and III (1819) 528; DC. Prodr. VII, 1, 136; Ldb. Fl. Ross. II, 2, 805; Kirp. in Majevskii, Fl. (1954) 563.—*L. stricta* δ. *integrifolia* Bogenh. Taschenb. Fl. Jena (1850) 269.—*L. quercina*

β. integrifolia Bisch Beitr. z. Fl. Deutschl., Cichorieen (1851) 206.—*Lactucopsis chaixii* and *L. altissima* Sch. Bip. in Vis. and Panč in Mém. Reale Inst. Veneto XV (1870) 6 (Pl. Serb. rar. III).—*L. quercina* ssp. *sagittata* (Waldst. and Kit.) Soó. sec. Jávorka.—Soó. A. Magyar Növényv. Kéz. II (1951) 723 Dostál, Kléč (1954) 802.—*L. quercina* ssp. *chaixii* (Vill.) Hayek in Hegi, Ill Fl. VI, 2 (1928). 1128.—*L. quercina* auct. Fl. Ross. p. p. non L.: Lbd. Fl. Ross. II, 2, 806; Schmalh. Fl. II, 168; Fedtsch. and Fler. Fl. Evrop. Ross. 1059.—**Ic.**: Vill. op. cit. (1789), t. XXXII; Waldst. and Kit. op. cit. t. 1 (color. bona, sub *L. sagittata*); Bonnier, Fl. Compl. Ill. France, Suisse et Belg. VI (1923), t. 351, fig. 1682 (color.); Javorka and Csapody, Iconogr. Fl. Hungar. (1933), t. 561, fig. 4027.—**Exs.**: F. Schultz Herb. norm. nov. ser. cent. 19, No, 1811.

Biennial. Root thick, narrow-conical, often furcate. Stem 60–100(150) cm high, weakly sulcate, fistular, smooth or almost smooth. Lower leaves obovate, narrowed toward base into petiole, early-withering; middle cauline leaves oblong-elliptical to lanceolate, sessile, semiamplexicaul, sagittate at base, spinulose-toothed or subentire; upper leaves reduced, lanceolate-linear. Capitula with about 10 florets, cylindrical or almost cylindrical, with fruits 10–13 mm long, in corymbs or corymbose-paniculate inflorescence; peduncles slender, usually longer than capitula, with few reduced leaves resembling outer involucral bracts. Involucre three- or four-rowed; involucral bracts lanceolate or linear; young bracts finely appressed-hairy on outer surface, mature bracts slightly pubescent (under a lens!); inner bracts longest, with membranous border, subobtusate, usually with numerous red spots on dorsal side. Corolla yellow. Achenes (excluding beak-like part) 4–5 mm long and 1.25 mm wide, oblong-ellipsoid, flattened, almost black, with (two) three to five prominent longitudinal ribs on each side, and transversely sinuate rows of light-colored membranous outgrowths or somewhat stiff hairs (under a hand lens!), apically narrowed into black, very thin beak-like part, up to 2.5 mm long and terminating in light-colored disk bearing pappus; pappus of very fine, white, silky hairs, almost smooth (under high magnification slightly barbed), fragile, falling individually, 5–6 mm long. Flowering June to August.

Deciduous forests and shrub thickets; forest-steppe and steppe zones, in the Caucasus up to middle mountain zone,—*European Part*: Upper Dnieper, Middle Dnieper, Volga-Don, Trans-Volga Region, Black Sea Region, Crimea, Lower Don; *Caucasus*: Ciscaucasia, Eastern Transcaucasia, ?Western Transcaucasia (Novorossisk, literature records, ?southern Transcaucasia (rarely; literature records). *General distribution*: central Europe, Atlantic Europe, western Mediterranean, Balkans-Asia Minor. Described from southeastern part of France. Type in Paris(?).

Economic Importance. The milky latex has properties similar to that of *L. stricta* (cf. p. 286)

6. *L. wilhelmsiana* Fisch. and Mey. in DC. Prodr. VII, 1 (1838) 134; Ldb. Fl. Ross. II, 2, 803; Boiss. Fl. or. III, 808; Grossh. Fl. Kavk. IV (1934) 257 and Opred. Rask. Kavk. 516; Klok. in Vizn. Rosl. URSS 604; Schchian in Fl. Gruzii VIII, 687; Stank. and Tal. Opred. Vyssh. Rast. (1957) 443; Askerova in Fl. Azerb. VIII, 553.—*L. stricta* Waldst. and Kit. var. *Hohenack.* in Bull. Soc. Nat. Mosc. XI, 3 (1838) 270.—*Lactucopsis wilhelmsiana* Sch. Bip. in Vis. and Panč. in Mém. Reale Inst. Veneto XV (1870) 6 (Pl. Serb. rar. III).—**Exs.:** Pl. or. exs. No. 75.

Biennial. Root often tuberous. Stems (50)60–120(150) cm high, weakly sulcate, fistular, smooth or almost smooth. Leaves (excluding upper) pinnatisect, semiamplexicaul, with short auriculate-sagittate base, lower leaves petiolate, other sessile; leaf segments narrow-triangular or linear-lanceolate, less often irregular in shape, often antrorse or retrorse, sometimes erect and horizontal, entire or more or less distinctly spinose-toothed; upper cauline leaves narrow-triangular or linear, reduced in inflorescence. Capitula of about 15 florets, cylindrical or almost cylindrical, with fruits (10)13–15 mm long, in lax, often few-headed corymbose-paniculate inflorescence; peduncles slender, unequal, with one to few reduced leaves, resembling outer involucre bracts. Involucre three- or four-rowed; young involucre bracts finely appressed-hairy on outer surface with very short papilliform hairs, mature bracts weakly pubescent (under a hand lens!); inner bracts longest, with membranous border, apically attenuate, often with more or less numerous red spots on dorsal surface. Corolla yellow. Achenes (excluding beak-like part) about 5 mm long and 1.25 mm wide, oblong-ellipsoid, flattened, or almost so, with five or more prominent longitudinal ribs on each side, and transversely sinuate rows of light-colored membranous outgrowths or stiff hairs (under a lens!) most distinct in upper narrowed part of achene, very gradually extended into thin, black, beak-like part, up to about 3.5 mm long, terminating in light-colored disk bearing pappus; pappus of very fine white, silky, almost smooth hairs (under high magnification, slightly barbed), fragile, falling individually, 5–6 mm long. Flowering May to August. (Plate XVII, Fig. 1.)

Steppe, forest-steppe, and middle mountain zone; edges of deciduous forests, in shrub thickets. —*European Part:* Middle Dnieper. Black Sea Region (both regions of the European USSR, indicated only on the basis of literature records and needing confirmation); *Caucasus:* Ciscaucasia, Eastern and Southern Transcaucasia, Endemic (?). Described from territory of present Nakhichevan ASSR. Type in Leningrad.

Note. This species is rather doubtful, and its separate status needs to be confirmed. It is often mentioned in descriptions that the “beak” (i.e. the narrow beak-like part) in *L. wilhelmsiana* is as long as the achene. This is not correct, as the narrowed part itself almost never exceeds 3

mm in length. In practice, the fruits of *L. wilhelmsiana* can be distinguished from those of *L. stricta* only with difficulty. The tuberous thickening of the root, also given as a characteristic feature of *L. wilhelmsiana* is not always developed. Doubt about the separateness of *L. wilhelmsiana* was raised already by Boissier (l.c.) in his note on this species.

Subgenus 3. *Pterachaenium* (Kitam.) Kirp. stat. nov.—*Lactuca* sect. *Pterachaenium* Kitam. in Acta Phytotax et Geobot. VI (1937) 237.

Achene completely flat, almost black, ellipsoid or oblong-ellipsoid, with one or few prominent longitudinal ribs, appearing slightly rugose from transversely sinuate rows of very short hairs (under high magnification!), apically attenuate into small conical neck with very short yellowish-green beak, or terminating in short but broad collar, without beak, and abruptly transitional to broadly truncate, funnel-shaped disk bearing pappus. Pappus of white, fine, fragile hairs, falling individually. Corolla yellow or pale yellow.

292 Biennial or perennial, mostly forest plants, with characteristic underground, narrow, fusiform thickenings. Only a few species are indigenous to the USSR, growing almost exclusively in the Far East and, less frequently, in Eastern Siberia; outside the USSR, in the Korean Peninsula, China, Japan, India, Indochina, Sunda Islands and the Philippines. The subgenus is botanically and geographically quite isolated from the other subgenera of *Lactuca*, and less closely related to typical *Lactuca*. Type of subgenus : *Lactuca indica* L.

7. ***L. indica*** L. Mant. II (1771) 278; DC. Prodr. VII, 1, 136; Gagnep. in Fl. Gén. Indo-Chine III, 654; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 187; Kitag. in Report Inst. Sc. Res. Manch. III, App. 1, 456 (Lineam. fl. Manshur.); Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1 (1956) 137, incl. f. *runcinata* Kitam. (Compos. Jap. V).—*Prenanthes squarrosa* Thunb. Fl. Jap. (1784) 303.—*Lactuca brevirostris* Champ. ex. Benth. in Hooker's Journ. Bot. IV (1852) 237; Hook. f. Fl. Brit. Ind. III, 405.—*L. amurensis* Rgl. and Maxim. ex Rgl. in Ind. Sem. Hort. Petrop. (1857) 42; Maxim. in Mém. Acad. Pétersb. div. sav. IX, 178 (Primit. Fl. Amur. No. 457).—*L. squarrosa* Miq. in Ann. Mus. Bot. Lugd.-Batav. II (1866) 189; Ej. Prolus. Fl. Jap. (1866–1867) 121 and 362; Maxim. in Bull. Acad. Sc. Pétersb. XIX (1874) 526 (incl. f. *runcinata* Maxim. and f. *indivisa* Maxim.); Kom. in Tr. Peterb. Bot. Sada XXV (1907) 778 (Fl. Man'chzh. III, No. 1648) (incl. var. *integrifolia* Kom., var. *dentata* Kom. and var. *runcinato-pinnatifida* Kom. op. cit p. 779); Kom. and Alis. Opređ. Rast. Dal'nevost. Kr. II, 1098, 1101; Nevski in Sorn. Rast. SSSR. IV, 344; Popov, Fl. Sr. Sib. II, 787.—*L. indica* f. *indivisa* (Maxim.) Hara, Enum. Spermat. Jap. II (1952) 220.

Biennial. Main root usually robust, or plant with distinct, underground, narrow, fusiform, tuberous thickenings. Stem (60)90–120(200) cm high, often reddish (especially below), weakly sulcate, smooth, branched above. Leaves usually sessile, with long cusp or acuminate; all leaves, except uppermost, with somewhat thick midrib, often with narrow squamiform hairs, sometimes rather long, reddish; shape of leaves extremely variable: from entire, linear, oblong-linear, or linear-lanceolate, with semiamplexicaul auriculate-sagittate base (f. *indivisa*) to more or less strong pinnatisect or runcinate-pinnatisect, with sinuate or spinose-toothed segments (f. *runcinata*); lower leaves withering before anthesis, petiolate; uppermost leaves strongly reduced, linear-lanceolate or linear. Capitula of about 25 florets, almost cylindrical or broadly cylindrical, 13–15 mm long with fruits, usually in narrow paniculate or racemose-paniculate inflorescence; peduncles slender, unequal, but often longer than capitula, with few small, reduced, leaves resembling involucre bracts. Involucre mostly three-rowed; involucre bracts often green, very finely appressed-hairy on dorsal surface (under a lens!), more or less reddish at apex; at least inner bracts with membranous border. Corolla, when fresh (according to literature records), pale yellow or almost white, pale blue on drying. Achenes ellipsoid, about 5 mm long and 2–2.5 mm wide, sometimes slightly asymmetrical, almost black, flat, usually with only one prominent rib on each side and numerous light-colored stiff, upward-directed, very short (under a lens!) hairs, in sinuate-transverse rows throughout, apically attenuate into conical neck with short (about 1 mm long) yellowish-green beak, terminating in broad disk with more or less well-developed ridge bearing pappus; pappus hairs very thin, fragile, about 8 mm long. Flowering (June) July to August (September). (Plate XVII, Fig. 4.)

Old fields, weed in crops, riverine meadows and shrub thickets, meadow patches in open forests, rarely along sea coasts.—*Eastern Siberia*: Dauria (less often); *Far East*: Zeya-Bureya, Ussuri. *General distribution*: Japan, China, Indo-Himalayas. Besides, found in the Philippines, Java and Sumatra. Described from Java from collections of Osbeck. Type in London.

Note. Apparently, the semi-weedy nature of this species explains its great variability. Particularly noticeable is the variability in leaf form. The most widespread variants are f. *indivisa*, with entire leaves, and f. *runcinata*, with more or less strongly divided, often runcinate leaves. The numerous other transitional forms do not deserve special names. According to V.L. Komarov, forms with entire leaves are confined to the meadows and shrub thickets with the drier soils, while the forms with divided leaves are found on the fertile soils.

So far, I have not been able to examine the authentic specimens. Nevertheless, the viewpoint of Kitamura, Merrill, Hanpen, Ling-Zhung and many others, identifying *Prenanthes squarrosa* Thunb. with *Lactuca indica* L., apparently is correct. The relatively southern collection of *L. indica*, which was available to us (for example, from southern China right up to Hainan Island), is characterized by entire leaves, sometimes flocculose-pubescent stems (under a lens!) and a somewhat strongly developed ridge on the pappus-bearing disk. However, considering the extreme polymorphism of this species, these differences can hardly be accorded taxonomic significance.

In the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, the two sheets collected by Stukov from the Transbaikal Region were preserved under the name "*Mulgedium floribundum* Zing." I did not find any description under this name. Hence, these specimens should be included under *L. indica*.

8. ***L. triangulata*** Maxim. in Mém. Acad. Pétersb. div. sav. IX (1859) 177 (Primit. Fl. Amur. No. 457); Rgl. in Mém. Acad. Pétersb. ser. VII, 4, 97 (Tentam. Fl. Ussur. No. 306); Kom. in Tr. Peterb. Bot. Sada, XXV, 294 777 (Fl. Man'chzh. III, No. 1647); Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II, 1098; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 187; Kitag. in Report Inst. Sc. Res. Manch. III, App. 1, 456 (Lineam. fl. Manchur.); Sugaw. Ill. fl. Saghal. IV, 1931; Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1, 142 (Compos. Jap. V); Vorobev in Tr. Dal'nevost. Fil. Ser. Bot. III(V), 77 (Materialy k Fl. Kuril'skikh o-vov, No. 975).—*L. triangulata* Maxim. var. *sachalinensis* Kitam. in Acta Phytotax. et Geobot. XI, 2 (1942) 126.—**lc.**: Sugaw. op. cit. t. 889.

Biennial or pernnial. Plants with more or less distinct, underground, narrow-fusiform, tuberous thickenings. Stem 60–120(250) cm high, shallow-sulcate, green or reddish below, branched from middle or, often, from upper third (and above). Leaves thin, green above, glaucous beneath, unevenly spinose-toothed along margin, sometimes with few, narrow, pale, squamiform hairs (under a lens!) also on surface and between teeth; lower leaves (usually early-withering and therefore frequently absent) on long, narrow-winged, slightly expanded at base, almost semi-amplexicaul petioles, terminating in almost half as long, triangular, triangular-ovate, or triangular-hastate lamina, acute, emarginate-reniform at base; petioles of middle cauline leaves gradually reduced, but increasingly broad-winged, with broad, hastate or auriculate, semiamplexicaul base and usually triangular or rhombic lamina; upper cauline leaves reduced, sessile, elliptical to oblong and lanceolate. Capitula, with 10–15 florets, cylindrical or cylindrical-campanulate, about 10 mm long with fruits, in rather lax

and narrow-paniculate or racemose-paniculate inflorescence; peduncles slender, conical, usually much longer than capitula, slightly swollen above below capitulum. Involucre two- or three-rowed; involucre bracts with fine appressed pubescence on dorsal surface (under a hand lens!); inner bracts longer, slightly narrowed in middle, subobtusate, narrowly membranous along margin. Corolla yellow. Achenes about 4 mm long and 2 mm wide, ellipsoid or broadly oval, flat or almost flat, sometimes concave, dark brick-red to dark violet and almost black, with one strongly raised longitudinal rib each side, or often two on one side; achenes (under a hand lens!) appear rugose or divided into individual cells from transverse sinuate rows of very short, upward-directed hairs (more distinct on lateral sides of achene), apically shallow-emarginate, bearing short (0.2–0.3 mm long) and relatively broad collar from center terminating into still broader light-colored annulus bearing about four- or five-angled disk with pappus of very thin, fragile, 6–7 mm-long hairs. Flowering July to August. (Plate XVII, Fig. 5.)

- 295 In shady mountain forests, on stony but humus-rich soils; less often in herb meadows, on gravel deposits of mountain streams, etc.—*Far East*: Ussuri, Sakhalin (Sakhalin, Iturup Island among the Kurils). *General distribution*: Japan (Hondo Island). Korean Peninsula, northeastern China. Described from collections of Maximowicz from Amur. Lectotype and paratypes preserved in Leningrad.

Note. Kitamura recognized *L. triangulata* Maxim. var. *sachalinensis* Kitam., with a crisped-hairy stem. This character was not found in the scanty material at our disposal.

9. ***L. raddeana*** Maxim. in Bull. Acad. Sc. Pétersb. XIX (1874) 526 and in Mém. Biol. IX, 3 (1874) 355; Kom. in Tr. Peterb. Bot. Sada XXV, 776 (Fl. Man'chzh. III, No. 1646); Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II, 1098; Ling in Contrib. Bot. Nat. Acad. Peip. III, 4, 188; Kitag. in Report Inst. Sc. Res. Manch. III, App. 1, 456 (Lineam. fl. Manshur.); Sugaw. Ill. fl Saghal. IV, 1929; Kitam. in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1, 138 (Compos. Jap. V); Vorobiev in Tr. Dal'nevost. Fil. Ser. Bot. III(V), 77 (Materialy k Fl. Kuril'skikh o-vov, No. 974).—*L. amurensis* auct. non Rgl. and Maxim.: Herd. in Bull. Soc. Nat. Mosc. XLIII, I, 2, 109 (Pl. Raddeanae Monopet. IV, No. 222).—*L. triangulata* auct. non Maxim.: Herd. ibid. (No. 223).—**lc.**: Sugaw. op. cit. t. 888.

Biennial (or perennial?). Plants with more or less distinct, underground, narrow-fusiform thickenings. Stem 65–120(200) cm high, weakly sulcate, often reddish, usually rather densely covered with narrow squamiform hairs, branched above and glabrous here. Leaves highly variable, green above, glaucous beneath, unevenly erose, spinose-toothed,

and usually with narrow reddish frill, and short squamiform hairs (under a hand lens!) on both sides and along margin (more distinct along veins beneath); lower leaves (early-withering) mostly on long, narrow-winged petioles, with lyrate-pinnatisect (or pinnatipartite) lamina, with triangular-hastate or triangular-ovate apical segment, and one to three pairs of lateral segments usually retrorse; middle and upper cauline leaves on broad-winged petioles, sometimes with a pair of lateral lobes, often without, with ovate, ovate-triangular or oblong-rhombic lamina; uppermost leaves strongly reduced, sessile, mostly oblong or lanceolate. Capitula with 9–10 (according to literature records, up to 14–15) florets, almost cylindrical, slightly swollen in lower part and somewhat broadened in upper, about 10 mm long with fruits, usually in narrow-paniculate inflorescence; peduncles slender, unequal, but often as long as capitula or longer, with few reduced leaves resembling involucre bracts. Involucre mostly two-rowed; involucre bracts herbaceous; inner bracts longer, narrow-ovate, often reddish, more or less distinctly narrowed below middle, convex, subobtusate. Corolla (according to literature records) pale yellow or straw-yellow. Achenes 3–4 mm long, 1.5–2 mm wide, ellipsoid, flat, often curved, dark violet to almost black, with few strongly raised ribs on each side and light-colored short hairs in transverse sinuate-rows, more distinct in upper part of achene (under a lens!), toward base slightly narrowed, with very short (sometimes not distinct) 0.1–0.3 mm long collar at apex, terminating in light colored, roundish, four- or five-angled disk with pappus; pappus of thin, about 6 mm-long, fragile hairs, falling singly. Flowering June to September. (Plate XVII, Fig. 2.)

In valley meadows among tall grass, shrub thickets, logged areas, deciduous (mainly open) forests, very rarely in old fields.—*Far East*: Zeya-Bureya, Ussuri, Sakhalin (Sakhalin and southern Kurils). *General distribution*: Japan, Korean Peninsula, northeastern China. Described by Maximowicz from Amur Basin. Lectotype (collections of Radde from Bureya Range) and paratypes preserved in Leningrad.

Note. Kitamura (*Journ. Jap. Bot.* XXI (1947) 52) recognized *L. raddeana* var. *elata* (Hemsl.) Kitam. (basonym: *L. elata* Hemsl. in *Journ. Linn. Soc.* XXIII (1888) 481). It differs from the typical form by having a tall (up to 2 m) habit and usually three-ribbed achene. Kitamura reported it from Sakhalin and Kunashir. There are only two sheets from Sakhalin in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, while there are no collections at all from Kunashir. This variety is not apparent on the basis of the material examined by us from the USSR. The question of var. *elata* remains unresolved for the present.

L. raddeana is a species with extremely variable leaves; the major forms are mentioned in the description. Besides, plants are found in which the leaves are sessile from the very base or almost from the base of the

stem and have an entire or nearly entire lamina; the upper and middle leaves are sometimes pinnatilobate or pinnatipartite, or they have a rhomboid, ovate, or oblong lamina (sometimes also a different form of the lamina) with a more or less broad, cuneately winged petiole. These variations in leaf shape have no taxonomic importance.

The ranges of *L. raddeana* and *L. triangulata* partly coincide. However, intermediate or hybrid forms have not been found in the contact zone (probably because of the significant ecological isolation of these species).

Subgenus 4. *Lactuca*.—*Lactuca* sect. I. *Scariola* DC. Prodr. VII, 1 (1838) 133, p. p.—*Lactuca* subgen. *Scariola* Babcock, Stebbins. and Jenkins in Cytologia, Fujii Jubil. vol. (1937) 191, p. p. solum nomen.

- 297 Achenes flattened or flat, variable in color (gray, brownish, dark brown of different shades, olive, dark violet to almost black), narrow-obovoid or oblong-ellipsoid, with rather numerous or, less often, only one to three prominent longitudinal ribs, usually covered with short, erect, light-colored hairs (under a hand lens!); besides, achene surface often with very short, transversely sinuate stripes of extremely short hairs (under high magnification!); a thin filiform beak at achene apex, generally differing in color from rest of achene. Pappus of white, very thin hairs, fragile or more or less strongly attached to the broad disk. Corolla yellow, less often lilac or pink.

Annual or biennial, less often perennial herbs or semishrubs, mostly growing in dry (steppe, semidesert, or desert) regions of somewhat saline soils.

Type of subgenus: type of genus.

Section 1. *Lactuca*.—*Lactuca* sect. 1. *Scariola* § 2. *Xanthinae* DC. Prodr. VII, 1 (1838) 135, p. p.—*Lactuca* sect. 1. *Lactucae genuinae* W.D. Kock, Synops. fl. Germ. et Helvet. (1837) 431, p. p.

Achenes narrow-obovoid or oblong-ellipsoid, with more or less numerous prominent longitudinal ribs and well-developed filiform beak almost as long or one and one-half to two times as long as achene. Corolla yellow.

Type of section: type of subgenus.

10. ***L. serriola*** Torner in L. Centur. II Plant. (1756) 29 (non vidi!) and in Amoenit. acad. IV (1759) 328; Grossh. Fl. Kavk. IV (1934) 257 and Opred. Rast. Kavk. 517; Kraschen. in Fl. Yugo-Vost. VI, 469; Klok. in Vozn. Rosl. USSR (1950) 603; Schchian in Fl. Gruzil VIII, 688; Szafer, Kulcz., B. Pawl. Rośl. Polskie (1953) 743; Kirp. in Majeovski. Fl. (1954) 633; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2, 1116; Dostál, Klič (1954) 801; Stank. and Tal. Opred. Vyssh. Rast. (1957) 443; Mikhailovskaja in Fl. SSSR V, 191; Kirp. in Fl. Turkm. VII, 335; Askerova in Fl. Azerb. VIII,

- 555; Kovalevskaja in Fl. Uzb. VI, 484.—*L. scariola* L. Sp. pl. ed. 2. (1763) 1119; DC. Prodr. VIII, 1, 137; Ldb. Fl. Ross. II, 2, 805; Schmalh. Fl. II, 168; Fedtsch. and Fler. Fl. Evrop. Ross. 1058; O. and B. Fedtsch. Perech. Rast. Turk. IV, 320 (Consp. Fl. Turk. No. 2783); Nevski in Sorn. Rast. SSSR IV, 341; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4, 190; Perf. Fl. Sev. Kraya II–III, 376; Govorukhin. Fl. Urala 520; Pavlov, Fl. Tsentr. Kazakhst. III, 366; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 103; Kryl. Fl. Zap. Sib. XI, 3026; Grubov, Consp. Fl. MNR 282, No. 1856 (Tr. Mong. Kom., Vyp. 67); Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 431 (Fl. of Afghanistan, 1960); Nikitina, Mater, po fl. Sev. Skl. Kirg. Ala-too 111, No. 1128; 298 Vvedensky et al. Opred. Rast. Golodnoi Step'i 40 (Tr. Tashk. Gos. Univ. Vysh. 178, Bot.).—*L. sylvestris* Lam. Fl. Fr. II (1778) 84.—*L. latifolia* Gilib. Fl. Lithuan. III (1782) 234; Ej. Exerc. phytol. I (1792) 188.—*L. virosa* Luce, Topogr. Nachr. Ins. Oesel (1823) 260, non L. —*L. scariola* β . *integrifolia* Bogenh. Taschenb. Fl. Jena (1850) 269.—*L. scariola* α . *syvestris* Bisch. α . *vulgaris* and β . *integrifolia* Bisch. Beitr. z. Fl. Deutschl. Cichorieen (1851) 189.—*L. dubia* Jord. Pugill. plant. nov. (1852) 119 (non vidi!).—*L. scariola* β . *angustana* Lindem. in Bull. Soc. Nat. Mosc. XLV, I, 2 (1872) 303.—*Ic.*: Rchb.f. Ic. fl. Germ. et. Halvet. XIX (1859) t. 70 (MCCCCXXI) fig. 1–6 (sub *L. scariola*); Javorka and Caspody, Iconogr. fl. Hungar. (1933) t. 561, fig. 4030; Hegi, op. cit. 1116, fig. 795; Dostál, op. cit. 799; fig. 2216; Mikhailovskaja, op. cit. 193, Plate LXV.—*Exs.*: Kar. and Kir. No. 874; Callier, It, Taur. tert. (1900) No. 792 (sub *Lactuca scariola* L. var. *integrifolia* Bisch.); Novopokr. Gerb. Donsk. Fl. No. 80; Hayek. Fl. Stir. exs. No. 1277; Billot, Fl. Gall. et. Germ. exs. No. 2704 (sub *L. scariola* L., sicut omnia exsiccata sequentia); Kickxia Belgica, No. 381; Petrak Fl. Bohem. et Morav. exs. No. 400; Fl. exs. austro-hung. No. 3398; Fl. exs. reip. Bohem. Slov. Nos. 634, 983.

Annual or biennial. Stem (30)60–125 cm high, more or less sulcate, whitish or yellowish (sometimes weakly reddish-violet at base), smooth or with sparse stiff spinules below, branched in upper half. Leaves glaucous, erose-pinnatifid, often with two retrorse lobes, sessile, amplexicaul, with sagittate base, usually with yellowish stiff spinules along midrib beneath, spinulose-toothed, vertical in clear weather at sunny places; uppermost cauline leaves usually lanceolate, undivided; sometimes all leaves more or less undivided, densely spinulose-toothed. Capitula cylindrical or oblong, 10–13 mm long with fruits, with 15–25 florets, on peduncles in paniculate, often pyramidal inflorescence; peduncles usually longer than capitula, usually with one or two very small scaly leaves, often tomentose or papulose on outer surface, sometimes indistinctly transitional to involucre bracts. Involucre bracts deflexed on maturation of achenes, three- or four-rowed, arachnoid-lanate or papulose on outer

surface, usually with one to several violet spots or slightly violet, subobtusate, and sometimes with apical tuft of transparent hairs; outer bracts ovate or triangular; inner ones linear- or oblong-lanceolate, with membranous, slightly sinuate border. Corolla yellow (turning blue on drying). Achenes 3–3.5 mm long and up to 1 mm wide, gray, brownish, or olive-colored, narrowly obovoid or oblong-ellipsoid, flattened, with (five) seven to nine prominent longitudinal ribs on each side, along them with rather long, erect, light-colored hairs (under a hand lens!), mostly in upper part, and indistinct transversely sinuate stripes of fine hairs (under high magnification!) in between them; achene apices attenuate into about 0.5 mm long, thin collar, converging in filiform whitish beak slightly or one and one-half (two) times as long as achene, terminating in flat-conical, reddish-brown disk bearing pappus of very thin, white, soft, slightly barbed (under a hand lens!), about 6 mm-long hairs. Flowering June to September (October). (Plate XVIII, Fig. 2.)

Weedy places, near dwellings and roadsides, in crops and old fields, orchards, kitchen gardens and vineyards, on irrigated lands and near irrigation channels as well as in gorges, ravines and valleys in mountains and foothills near streams.—*European Part*: Dvina-Pechora (extreme southwest!), Baltic Region, Upper Volga, Volga-Kama, Upper Dnieper, Middle Dnieper, Volga-Don, Trans-Volga Region, Upper Dniester, Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga; *Caucasus*: all regions. *Western Siberia*: Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-Sayans (south); *Soviet Central Asia*: all regions. *General distribution*: Scandinavia, central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, Armenia and Kurdistan, Iran, Indo-Himalayas, Dzhungaria-Kashgaria, Mongolia, China (northern), ?Beringia, ?Tibet, introduced in North America. Described from southern Europe. Type in London.

Note. A highly variable species with numerous poorly delineated separate forms within its wide distribution range. In the European USSR, forms with more or less entire leaves are often found in Ciscaucasia and the northern Caucasus. Forms entirely without spinules are often found in Central Asia. Krascheninnikov labeled one such sheet as "*Lactuca scariola* L. v. *laevis* Krasch." Quite sclerophyllous forms are found in the Nakhichevan ASSR as well as in the south of Central Asia, which differ by having stiff, flat and more glaucous leaves, and certain other features; however, they are too insignificant to be given serious taxonomic importance.

Economic Importance. *L. serriola* has high fodder value. For details see Larin et al. Kormovye rastenlya senokosov i pastbishch [Fodder Plants of Grasslands and Pastures of the USSR], Vol. III, Sel'khozgiz, Moscow-Leningrad, 1956, 676 p.

11. ***L. sativa*** L. Sp. pl. (1753) 795 (incl. β . *capitata* L. and γ . *crispa* L.); DC. Prodr. VII, 1, 138; Ldb. Fl. Ross. II, 2, 806; Schmalh. Fl. II, 168; Kom. in Tr. Peterb. Bot. Sada XXV, 780 (Fl. Man'chzh. III, sine numero); Grossh. Fl. Kavk. IV (1934) 258 and Opred. Rast. Kavk. 517; Kraschen. in Fl. Yugo-Vost. VI, 469; Perf. Fl. Sev. Kraya II–III, 376; Govorukhin. Fl. Urala 520; Kryl. Fl. Zap. Sib. XI, 3028; Klok. in Vozn. Rosl. URSS 603; Szafer, Kulcz., B. Pawl. Roczn. Polskie (1953) 744; Kirp. in Majeovski, Fl. (1954) 633; Hayek in Hegi, Ill, Fl. 2 Aufl. VI, 2, 1118; Dostál, Klič (1954) 801; Stank. and Tal. Opred. Vyssh. Rast. (1957) 442; Mikhailovskaja in Fl. BSSR, V, 192; Askerova in Fl. Azerb. VIII, 556; Kovalevskaja in Fl. Uzb. VI, 487.—*L. scariola* β . *hortensis* δ . *sativa* Bisch. Beitr., z. Fl. Deutschl., Cichorieen (1851) 190.—*L. scariola* β . *sativa* 300 Moris, Fl. Sard. II (1840–1843) 531.—*L. scariola* β . *sativa* Boiss. Fl. or. III (1875) 809.—**Ic.**: Rchb. f. Ic. fl. Germ. et Helvet. XIX (1859) t. 70 (MCCCCXXI) fig. 7–14; Javorka and Csapody, Iconogr. fl. Hungar. (1933) t. 561, fig. 4029; Syreistsch. Ill. Fl. Mosk. Gub. III (1910) 331; Hegi. op. cit. 1119, fig. 797.

Annual or biennial. Stem 30–70(100) cm high, smooth, more or less sulcate. Leaves gradually strongly reducing upward, almost horizontal, lower leaves large, rotund-obovate or elliptical, narrowed into broad petiole, sometimes flexuous and often spinose-toothed; middle cauline leaves sessile, with deeply cordate base; upper cauline leaves variable, often orbicular-reniform, with auriculate or sagittate-amplexicaul base; leaves on peduncles very small, almost scaly, densely pubescent. Capitula in corymbose-paniculate inflorescence, more or less cylindrical, (6)10–13(15) mm long, with 15 florets. Involucral bracts not curved on fruiting, three- or four-rowed outer bracts ovate-lanceolate, inner oblong-linear, subobtuse, with narrow light-colored border. Corolla yellow. Achenes narrow or oblong-obovoid, about 4 mm long and 0.8–1 mm wide, gray or (less often) dark brown or brownish, flattened, not always strictly symmetrical, with large number of longitudinal ribs on each side, usually with erect hairs in upper part (under a lens!), rest smooth, apically attenuate into filiform, whitish or light brown beak, almost as long as achene and terminating in broad disk bearing pappus; pappus hairs numerous, thin, white, soft, slightly barbed (under a hand lens!), almost as long as achene. Flowering (May) July to August. (Plate XVIII, Fig. 3.)

Widely, though not commonly, cultivated in kitchen gardens as a vegetable for salads; sometimes found in wild.

Note. The native country of *L. sativa* is unknown. This species has been considered by many authors as a cultivated variety of *L. serriola*. However, *L. sativa* is distinguished from the latter by the shape and arrangement of the leaves (almost horizontal and not vertical), nature of the involucral bracts (after the maturation of fruits, they are deflexed in

L. serriola, and straight in *L. sativa*, and also, usually, by the broad inflorescence, whose branches are densely covered with small, sessile leaves, which are reduced upward; the many capitula in the inflorescence often do not develop fully and become globose. The latest information on the origin of cultivated lettuce can be seen in Lindquist "On the origin of cultivated lettuce." *Hereditas*, Vol. XLVI, 3-4, 1960).

Economic Importance. The cultivated varieties of *L. sativa* are annuals, which can be cultivated successfully from the extreme south to the extreme north both in open fields and under cover (in glass houses and hot beds). Lettuce leaves are rich in provitamin A and contain vitamins B₁, B₂, C and P and also vitamin E (according to some reports); they are also fairly rich in calcium and iron salts; lastly, they also contain phosphorus. Such a chemical composition makes lettuce leaves extremely valuable (in particular in the diet). Flowering plants are used in homeopathy.

Information on agronomy and the range of varieties of lettuce can be found in V.I. Edelshtein, "Ovshchevodstvo" [Vegetable Cultivation], 2nd ed., Sel'khozgiz, Moscow, 1953; and D.D. Brezhnev (Editor), "Sorta ovoshchnykh kultur" [Varieties of Vegetable Crops], Sel'khozgiz, Moscow-Leningrad, 1960.

The current status of the classification of cultivated lettuce is set forth in the book: Mansfeld, Vorläufiges Verzeichnis landwirtschaftlich oder gärtnerisch kultivierter Pflanzenarten, Berlin, Akad.-Verl., 1959. In a somewhat simplified form and with small corrections, the infraspecific classification of *L. sativa* can be presented as follows.

I. Convar. *sativa*.—Cfr. Helm, Kulturpfl. 2 (1954) 101, 125.

1. Var. *sativa*.—*L. sativa* L.s. str. (quoad typum, L. excl. β. and γ. Not cultivated.

2. Var. *angustana* Irish ex Bremer in Handb. Pflanzenzücht. 5 (1949) 339 (non Vidi!).—*L. sativa* var. *intergrifolia* Irish ex Stank. in Stank. and Tal. Opred. Vyssh. Rast. (1949) 720.

This includes the so-called asparagus varieties, in which the strongly thickened stem is eaten; leaves narrow, elongated.

3. Var. *longifolia*, Lam. Encycl. meth. III (1791-1792) 402 (sub nom.: γ. *Lactuca sativa longifolia*)

This includes the lettuce varieties grouped under the name "romaine" (in practice, known by the Latin name *L. sativa* var. *romana* hort.). Their elongated-obovate leaves form lax oblong-oval heads.

II. Convar. *incocta* Helm, Kulturpfl. 2 (1954) 102, 125.

4. Var. *crispa* L. 1. c. (sub nom. *L. sativa* Y. *crispa* L.).

It unites the leafy forms not producing heads. In the Russian literature, varieties of this group are usually cited under the names, *L. sativa* var. *acephala* Alef. and *L. sativa* var. *secalina* Alef., although Alefeld proposed a much more complex structure and such simplified representation of the classification—actually quite unwieldy—does not give a correct idea of it (cf. F. Alefeld. *Landwirtschaftliche Flora* ... Berlin, 1866).

5. Var. *capitala* L. 1. c. (sub nom. *L. sativa* β. *capitata* L.).

Leaves rotund, forming head.

The *L. sativa* × *L. serriola* hybrids are fertile. This property is used for varietal improvement of cultivated lettuce.

12. *L. saligna* L. Sp. pl. (1753) 796; DC. Prodr. VII, 1, 136; Ldb. Fl. Ross. II, 2, 804, p.p.; Schmalh. Fl. II, 168; Fedtsch. and Fler. Fl. Evrop. Ross. 1058; Grossh. Fl. Kavk. IV (1934) 257 and Opred. Rast. Kavk. 516, p. p.; Nevski in Sornye Rast. SSSR IV, 343; Kraschen. in Fl. Yugo-Vost. VI. 470; Klok. in Vozn. Ročl. URSR, 604; Schchian in Fl. Gruzii VIII, 691; Szafer, Kulcz., B. Pawl. Ročl. Polskie (1953) 743; Hayek in Hegi, III. Fl. 2 Aufl. VI, 2, 1125; Dostál, Kléč (1954) 801; Kirp. in Majejski, Fl. (1954) 632. Stank. and Tal. Opred. Vyssh. Rast. (1957) 442; Askerova in Fl. Azerb. VIII, 554, p. p.—*L. angustifolia* Gilib. Fl. Lithuan. III (1782) 234; Ej. Exerc. phytol. I (1792) 188.—*L. virosa* Hahl. Fiz. Opis. Tavrich. Obl. (1785) 160 (non *L. virosa* L.).—*L. caucasica* C. Koch in Linnaea XVII (1843) 275 (incl. α. *major* C. Koch and β. *minor* C. Koch. op. cit. p. 276); Ldb. Fl. Ross. II, 2, 806.—*L. cyanea* C. Koch in Linnaea XXIII (1850) 671.—*Ic.*: Rchb. f. Ic. fl. Germ. et Helvet. XIX (1859) t. 69 (MCCCCXX) fig. 1–2; Kraschen. op. cit. 471, Fig. 722; Hegi, op. cit. 1126, fig. 803; Dostál, op. cit. 799, fig 2219.—*Exs.*: Sch. Bip., Cichoriaceothesca, Suppl. II, No. 153; Billot Fl. Gall. et Germ. exs. No. 1700; Kickxia Belgica, Cent. I, 1865, No. 71; Fl. exs. reip. Bohem. Slov. No. 635.

Annual or biennial. Roots more or less slender, woody, (3)5–10(15) cm long. Stem (10)30–80(100) cm high, rather numerous from base, more or less arcuate, or stems few to solitary, erect, weakly sulcate, light yellowish, stiff, often virgate from base, solid or almost so. Leaves highly variable, green or glaucous, rather stiff, sessile, with sagittate semiamplexicaul base, densely but very finely appressed hairy (under a hand lens!), sometimes covered with dense, often uncate hairs (bristles) beneath along midrib; lower leaves runcinate-pinnatisect or emarginate-pinnatifid, with segments or lobes usually retrorse, with convolute margins, covered with few spinules; middle cauline leaves lanceolate-linear or linear, entire or somewhat toothed-spinose; upper leaves strongly reduced; sometimes all leaves linear. Capitula with 9–15 florets, almost cylindrical at flowering, broadened upward at fruiting, about (10)12–14(18)

mm long, on slender, virgate, branches in lax spicate raceme; peduncles slender, short or strongly reduced, and then capitula sessile. Involucre usually rectangular; involucre bracts greenish or more or less violet, short-appressed-hairy (under a hand lens!) on dorsal surface; inner bracts membranous-bordered, with convolute margins after fruiting, more or less strongly divaricate or deflexed. Corolla yellow, blue on drying. Achenes about 2.5 mm long and 0.6–0.7 mm wide, narrow-obovoid or oblong-ellipsoid, flattened, dark brown or olive-colored, usually with numerous prominent longitudinal ribs covered with stiff, upward-directed, very short hairs, more distinct in upper part of achene (under a hand lens!), achenes apically attenuate into short collar, with whitish filiform beak, usually one and one-half to two times as long as achene, terminating in small
 303 funnel-shaped disk bearing pappus; pappus of fragile, very thin, white, silky, apparently smooth (under high magnification, weakly barbed) hairs, about 5 mm long. Flowering (June) July to August (September). (Plate XVIII, Fig. 8.)

Dry sunny places, on saline, calcareous and stony soils, in steppe and semidesert, as a weed along banks of rivers, lakes and canals; usually solitary or in small groups.—*European Part*: Middle Dnieper (southeastern part), Volga-Don (southern part), Trans-Volga Region, Bessarabia, Black Sea Region, Crimea, Lower Don, Lower Volga; *Caucasus*: Dagestan (on lowlands), Eastern and Western Transcaucasia. *General distribution*: central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor. Described from France and Leipzig. Type in London.

Note. The general distribution given is approximate (cf. note to *L. altaica*). *L. saligna* is a highly polymorphic species, from which the western European botanists have segregated a series of forms, varieties, or even individual races; they also recognize the occurrence of the hybrid: *L. saligna* × *L. serriola*.

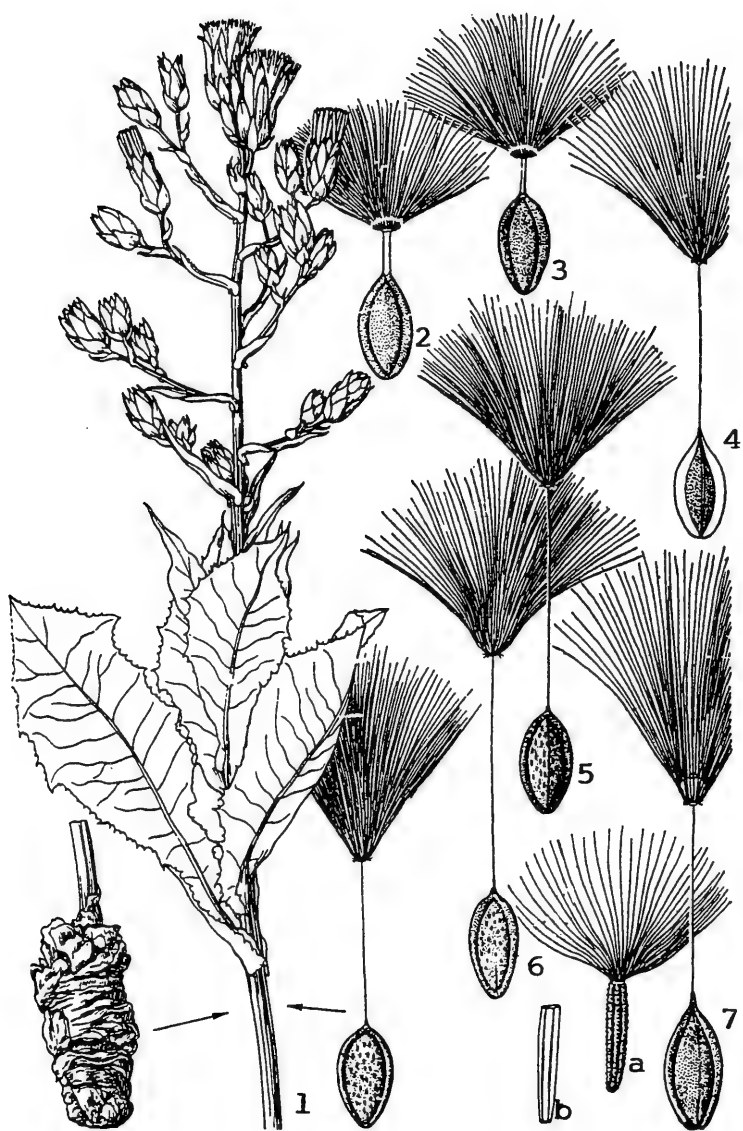
13. ***L. altaica*** Fisch. and Mey. in Ind. Sem. Hort. Petrop. XI (1846) 73; Kryl. Fl. Zap. Sib. XI, 3028; O. and B. Fedtsch. Perech. Rast. Turk. IV, 321 (Consp. Fl. Turk. No. 2785); Pavlov, Fl. Tsent. Kazakhst. III, 365; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 103; Kirp. in Fl. Turkm. VII, 341; Vvedensky et al. Opred. Rast. Golodnoi Step. 40 (Tr. Tashk. Gos. Univ. Vyp. 178, Bot.); Kovalevskaja in Fl. Uzb. VI, 484.—*L. saligna* L. var. *caule setoso* and var. *foliis laseibus* Hohenack. in Bull. Soc. Nat. Mosc. XI, 3 (1838) 270.—*L. saligna* γ. *robusta* Fisch. and Mey. in Ind. Sem. Hort. Petrop. V (1838) 37.—*L. saligna* auct. non L.: Ldb. Fl. Alt. IV, 155; O. and B. Fedtsch. Perech. Rast. Turk. IV, 321 (Consp. Fl. Turk.; No. 2784); Kryl. Fl. Zap. Sib. XI, 3027; Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 430 (Fl. of, Afghanistan, 1960); Zakirov, Fl. i Rastit. Bass. Zeravsh. II, 428.—**Exs.**: Kotschy, Pl. alepp. kurd. moss. 1843, No. 442b (sub, *L. saligna* L.

var. *wallrothii*); Sintenis, It. transcasp.-pers. 1900–1901, No. 982b (sub. *L. saligna* L.)

Annual or biennial. Roots more or less slender, woody. Stem 50–80(120) cm high, usually solitary (less often more or less numerous), simple or branched, stiff, slightly sulcate, stramineous or whitish, but usually violet below and more or less densely spinulose. Leaves glaucous, dense, sessile, at base sagittate, glabrous; lower leaves (sometimes partly also middle ones) pinnatipartite or erose-lobate, usually with deflexed lobes; middle cauline leaves linear, linear-lanceolate, or (less often) oblong, entire or shallow spinose-toothed, usually with prominent midrib beneath, often densely covered with yellowish spinules (bristles); upper leaves strongly reduced; sometimes all leaves linear-lanceolate. Capitula with
 304 (7)9–15(17) florets, more or less cylindrical at anthesis, later often narrowed near middle, broadened above at fruiting, about (10)12–13(16) mm long, on slender branches, forming lax racemose-paniculate inflorescence. Involucre usually four-rowed; involucre bracts greenish or with violet spots; outer bracts appressed hairy on dorsal surface (under a hand lens!); inner ones with membranous border, more or less strongly divaricate after fruiting, or deflexed down. Corolla yellow, blue or pinkish-violet on drying. Achenes 3–4 mm long and 0.6–0.8(0.9) mm wide, narrow-obovoid or oblong-ellipsoid, flattened, brown, dark brown, or grayish, with (5)7–9(10), prominent longitudinal ribs on each side covered with light colored, upward-directed hairs (under a lens!), which are relatively long, squarrose, and soft in upper part. Achenes covered with very short transversely sinuate stripes formed by extremely short hairs (under high magnification), apically attenuate into collar, bearing whitish or yellowish filiform beak more or less as long as achene, sometimes distinctly longer; beak with a disk bearing pappus of fragile, very thin, white, silky, more or less smooth, about 5 mm-long hairs (under high magnification, somewhat barbed). Flowering June to September. (Plate XVIII, Fig. 1.).

Steppe, semidesert and desert regions on saline lands, stony and gravelly river valleys, less often in fallows, and roadsides, and also a weed in irrigated fields; in mountains up to 2,000 m.—*European Part*: Trans-Volga Region, Lower Volga (Astrakhan); *Caucasus*: Dagestan (in mountains), Eastern and Southern Transcaucasia, Talysh; *Western Siberia*: Upper Tobol, Irtysh, Altai; *Soviet Central Asia*: Aralo-Caspian Region, Balkhash, Dzhungaria-Tarbagatai (only Dzhungaria?), ?Kyzyl-Kum, mountainous Turkmenia, Syr- Darya, Pamiro-Alai, Tien Shan. *General distribution*: eastern Mediterranean, Armenia and Kurdistan, Iran. Described from Altai. Lectotype in Leningrad.

Note. The range of *L. altaica* needs to be confirmed, especially its distribution outside the USSR, where this species passes as *L. saligna*. *L. altaica* is a polymorphic species, which is related to its wide distribution



- 1—*Steptorhanphus czerepanovii* Kirp., upper part of plant, root, achene; 2—*S. crassicaulis* (Trautv.) Kirp., achene; 3—*S. crambifolius* Bge., achene; 4—*S. persicus* (Boiss.) O. and B. Fedtsch., achene; 5—*S. tuberosus* (Jacq.) Grossh., achene; 6—*S. petraeus* (Fisch. and Mey.) Grossh., achene; 7—*S. linczevskii* Kirp., achene; 8—*Reichardia dichotoma* (Vahl) Freyn.:
 a) outer achene; b) inner achene.

and semi-weedy mode of life. In particular, specimens from the Caucasus differ from the typical and Mediterranean specimens, but the differences in the material available to me do not give in any way a definite picture. The situation is complicated by the fact that *L. altaica* evidently forms
 306 hybrids with *L. saligna*. In some regions of the European USSR, not indicated by me for *L. altaica*, specimens are found which are intermediate between this species and *L. saligna* but distinctly closer to *L. altaica*. These include one specimen from the Zilair District in the Bashkirian ASSR, one from the Pavlovsk District in the Voronezh Region, and two sheets each from the Derkul steppe and Chistyakovo (Donetsk Region)

It has been established long since that *L. altaica* is difficult to distinguish from *L. saligna*. In their original description Fisher and Meyer reported that the beak of *L. altaica* is more or less equal in length to the achene, whereas in *L. saligna* it is one and one-half to two times longer than the achene. This character has been given prominence by all subsequent authors, although, as a matter of fact, it by no means can always serve as the prime character, because in practice the achenes of *L. saligna* and *L. altaica* rarely differ in their beaks. The color of the achene is much more stable (lighter-colored in *L. altaica*), but even better are the long, squarrose, soft hairs on the upper part of the achene in *L. altaica*. Moreover, the lower part of the stem in *L. altaica* usually is violet and almost always covered with spinules, which are quite distinct on the midrib at least on some leaves, and lanceolate or linear-lanceolate leaves are noticeably dominant. Many plants are found, however, in which only by taking all of these characters together is it possible to distinguish *L. altaica* from *L. saligna* with confidence.

In the opinion of many authors, separating *L. altaica* from *L. serriola* is no less difficult, as their achenes are practically indistinguishable, and the presence of hybrids between them can hardly be doubted. Nevertheless, we do not share the skepticism of M.G. Popov, who wrote (op. cit.), concerning *L. altaica*: "Poorly differentiated from the previous one, it is better treated as simply a form of that one." Here "previous" means *L. serriola*. In the present case, differences in the vegetative organs, especially in the form of the leaves, are of great help. The leaves of *L. serriola*, except the uppermost, are pinnately cut and stiff; in *L. altaica*, at least, the upper ones (and partly also the lower leaves) are entire, small, stiff. Besides, *L. serriola* belongs to the so-called "compass" plants (laminae vertical, with the rib facing the sun), which is not typical of, *L. altaica*. However, only specially designed experiments and observations can resolve the question of whether *L. altaica* is a good species.

14. *L. georgica* Grossh. in Grossh. and Schischk. Sched. ad. herb. Pl. or. exsicc. fasc. I-VIII (1924) 8; Ej. Fl. Kavk. IV (1934) 257 and

Opred. Rast. Kavk. 516; Schchian in Fl. Gruzii, VIII, 687; Kirp. in Fl. Turkm. VII, 337; Askerova in Fl. Azerb. VIII, 554.—*Lactuca virosa*. auct. non L.: O. and B. Fedtsch. Perech. Rast. Turk. IV, 326 (Consp. Fl. Turk. No. 2781).—**lc.**: Schchian, op. cit. 689, Plate 440.—**Exs.**: Pl. or. exs. No. 25 (iso-typus!).

307 Perennial (or biennial?). Plants with robust tap root. Stems mostly solitary, 75–120(150) cm high, glabrous or with sparse, stiff, spinules below, sulcate, fistular, branched above. Leaves stiff, semiamplexicaul, elliptical (except upper leaves), ovate or oblong, with prominent network of veins beneath, often toothed-spinose; lower leaves almost entire or cut to various degrees, basally narrowed into broad-winged petiole, covered with stiff, about 2 mm long, spinules along midrib beneath; middle leaves usually pinnatisect, gradually reduced upward, often with isolated spinules beneath along midrib; upper leaves small, variable in form, mostly triangular with deeply emarginate base and auriculate appendages. Capitula cylindrical, with fruits 8–11 mm long, with about 15 florets, borne singly or in groups of few, almost sessile or, less often on more or less long peduncles; inflorescence paniculate or racemose, often robust. Involucre usually four-rowed; outer involucre bracts thinly and densely tomentose (and also glandular?), often violet; inner ones less densely pubescent, with subobtusate, often violet apex, and mostly with distinct midrib. Corolla yellow. Achenes dark violet or almost black, somewhat flattened or flat, 6–7 mm long, broad obovoid part up to 3–3.5 mm long (about 1.5 mm wide), abruptly narrowed at apex into narrow, about 1 mm long, collar bearing light-colored or dark brownish, filiform, 2–2.5 mm-long beak, with prominent ribs (usually seven) on each side covered with numerous light-colored stiff, short, upward-directed hairs (under a hand lens!); besides, achenes covered with very short, transversely sinuate, stripes of short light-colored hairs (under high magnification!); beak terminating in small funnel-shaped expansion bearing flat disk with pappus of thin, silky, almost smooth, fragile, 3–3.5 mm-long hairs. Flowering July to August. (Plate XVIII, Fig. 7.)

Banks of mountain rivers, rubble slopes and screes.—*Caucasus*: Dagestan, Eastern and Southern Transcaucasia; *Soviet Central Asia*: mountainous Turkmenia. Endemic (?). Described from Georgia. Type in Tbilisi, isotype in Leningrad.

Section 2. Micranthae Boiss. Fl. or. III (1875) 804.—Achenes narrow-obovoid or oblong-ellipsoid, with one or rarely three longitudinal ribs and distinct filiform beak as long as achene or two to four times as long. Corolla usually lilac of pink.

Lectotype of section: *Lactuca glauciifolia* Boiss.

15. **L. rosularis** Boiss. Fl. or. III (1875) 813; kirp. in Fl. Turkm. VII, 341. **lc.:** Kirp. op. cit. 339, Plate LIII.

308 Biennial (or perennial?). Root thick, vertical, branched above, terminating into few stems. Stems divaricately branched from base, 10–25 cm high, with remnants of petioles of dead leaves in lower part and slightly sulcate, glaucous surface, very shortly and unevenly pubescent (under a hand lens!), distinctly mixed with glandular hairs; fully developed leaves arranged in basal rosula or on lowermost part of stem, glaucous, oblong-spatulate or oblong-obovate, undivided, with distinct network of veins, finely rugose-plicate, densely appressed hairy (under a lens!), shortly and unevenly toothed, with dark cartilaginous spinules; upper cauline leaves more or less reduced (to scaly), semiamplexicaul, auriculate at base. Capitula cylindrical or oblong-cylindrical, of 10–20(25) florets, with fruits 5–7(10) mm long, in lax compound paniculate inflorescence; peduncles usually shorter than capitulum, bearing less often sessile, relatively large, glandular hairs. Involucral bracts (two) three- or four-rowed, reddish-violet, less often green with violet stripes or spots, thinly pubescent on outer surface, mixed with glandular hairs; innermost bracts less densely pubescent, often greenish, with thin membranous border. Corolla? Achenes about 3 mm long and 0.5–0.75 mm wide, dark or blackish-brown, narrow-obovoid or ellipsoid, almost entirely smooth (under high magnification, very short whitish hairs visible), more or less flat, with one distinct central rib, passing through center of ventral or dorsal sides continuing into a whitish, light yellow or greenish beak, more or less as long as achene and terminating in almost as long pappus of very thin, white, somewhat barbed hairs. Flowering May. (Plate XVIII, Fig. 6.)

On loose saline sands.—*Soviet Central Asia:* Kara-Kum (western part). *General distribution:* Iran. Described on the basis of Bunge's collections from Iran. Type in Leningrad.

Note. A rare plant for the USSR, so far found only in the Kazandzhik District of the Turkmenian SSR.

16. **L. glaucifolia** Boiss. Fl. or. III (1875) 813; Popov. in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 102; Kirp. in Fl. Turkm. VII, 341; Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 428 (Fl. of Afghanistan, 1960); Kovalevskaja in Fl. Uzb. VI, 486.—**lc.:** Kovalevskaja, op. cit., Plate XLVIII, Fig. 2.—**Exs.:** GRF, No. 3500.

Annual. Stems slender, (2)7–15(20) cm high, divaricately or dichotomously branched. Basal leaves usually rosulate, obovate or broadly spatulate, narrowed into broad petiole, irregularly toothed, covered beneath with rather long, crisped or flexuous, light-colored hairs; sometimes basal leaves pinnatisect, coarsely toothed; cauline leaves strongly reduced, often

- 309 almost scaly, amplexicaul. Capitula, on the average, with 10-15 florets, cylindrical to oblong- or conical-cylindrical, with fruits about 18 mm long, mature capitula slightly narrowed near middle, usually sessile or on short peduncles, less often on long peduncles, in lax dichotomous-paniculate inflorescence. Involucral bracts few, usually three- rowed; outer bracts with crisped hairs on dorsal surface (like leaves), inner ones narrow bordered; involucral bracts more or less squarrose after fruiting. Corolla yellow(?), blue on drying. Achenes about 3 mm long and up to 1 mm wide, dark brownish-yellow, narrow-obovoid or oblong-ellipsoid, flat, with very short transversely hairy stripes (under a hand lens!), and prominent rib in center, rugose-toothed upward along lateral ribs (under a hand lens!); achenes apically attenuate into filiform white beak two to three times as long as achene and terminating in pappus; pappus hairs thin, white, soft, somewhat barbed (under a hand lens!), almost as long as achene or slightly shorter. Flowering April to May(July). (Plate XVIII, Fig. 9.).

Gravelly sands and stony slopes, crevices of granite rocks, on gypsiferous deposits—everywhere on more or less saline substrates; from foothills up to 3,000 m.—*Soviet Central Asia*: Kyzyl-kum, mountainous Turkmenia, Pamiro-Alai, ? Tien Shan (western part). *General distribution*: Iran. Described from Bunge's collections from Iran. Type in Geneva; isotype in Leningrad.

Note. Hybrids with *Lactuca undulata* Ldb. are possible. The corolla, according to Boissier, is light blue, while according to Popov it is yellow.

17. **L. auriculata** DC. Prodr. VII, 1 (1838) 140; Boiss. Fl. or. III, 814; O. and B. Fedtsch. Perech. Rast. Turk. IV, 321 (Consp. Fl. Turk. No. 2787); Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 103; Zakirov, Fl. i. Rastit. Bass. Zaravsh. II, 429; Kovalevskaja in Fl. Uzb. VI, 487.

- Annual. Stem (5)7–30(50) cm high, slightly sulcate, more or less densely covered with rather long, pale, narrow-membranous hairs in lower part, bifurcate from base or middle. Leaves highly variable, mostly (excluding upper) on winged, near base on semiamplexicaul and more or less distinctly auriculate-sagittate petioles, thin, green above, glaucous beneath and often with thick midrib, covered with sparse hairs (of same type as on the stem); lamina lyrate-pinnatisect, with relatively large, reniform, reniform-ovate or rotund-ovate terminal segment and a few pairs of lateral unequal segments; all segments with shallow, roundish, crenate-toothed margin, their apices callose, subobtusate; sometimes most leaves crowded in lower part of stem, or laminae of lower and middle cauline leaves more or less undivided, panduriform, divided only slightly, and winged structure of petiole less distinct. Capitula of about 15 florets, cylindrical or cylindrical-conical, with fruits (9)10–11(12) mm long, in
- 310

lax corymbose inflorescence; peduncles very slender, usually longer than capitula. Involucre mostly four-rowed; involucre bracts greenish, inner ones with membranous border, subobtus and reddish. Corolla lilac-blue. Achenes 2–3 mm long and about 0.75 mm wide, narrow-obovoid, flat, dark or blackish brown, usually with three prominent longitudinal ribs on each side covered entirely with transversely sinuate stripes of extremely short light-colored hairs (under high magnification!), and also with numerous, very short, upward-directed, stiff hairs, more distinct on lateral ribs (under a hand lens!); achenes terminating in roundish notch, from which thin pale, 3.5–4.5 mm long beak arises; pappus of rather thin, white, silky, almost smooth (under high magnification, often finely barbed), 3–4 mm long hairs, separated from disk with difficulty. Flowering May to August(October). (Plate XVIII, Fig. 4.)

Semidesert zone and juniper forest zone up to 2,500 m; among stones, on slopes, screes, among coastal gravels, herb thickets and scrubs, sometimes a weed of roadsides and in crops.—*Soviet Central Asia*: Dzhungaria-Tarbagatai (only one authentic sheet from Dzhungarian Alatau seen),?Syr-Darya, Pamiro Alai, Tien Shan. *General distribution*: Iran, Indo-Himalayas. Described from Wallich's collections from Nepal. Type in Geneva?

Note. It is not clear why this species has been omitted in the latest manuals of Siro by Kitamura on the flora of Afghanistan and, especially, the flora of Nepal.

18. **L. undulata** Ldb. Icon. pl. fl. Ross. II (1830) 12, t. 129; Ej. Fl. Alt. Iv (1833) 156; DC. Prodr. VII, 1 (1838) 135 (incl. *β. dentata* DC.); Ldb. Fl. Ross. II, 2, 803; Boiss. Fl. or. III (1875) 813; O. and B. Fedtsch. Perech. Rast. Turk. IV, 321 (Consp. Fl. Turk. No. 2786); Grossh. Fl. Kavk. IV (1934) 255 and Opred. Rast. Kavk. 517; Ling in Contrib. Inst. Bot. Nat. Acad. Peip. III, 4,189; Pavlov, Fl. Tsentr. Kazakhst. III, 365; Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 103; Kryl. Fl. Zap. Sib. XI, 3026; Kirp. in Fl. Turk. VII, 340; Nikitina, Mater. po Fl. Sev. Skl. Kirg. Ala-too, 111, No. 1130; Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 431 (Fl. of Afghanistan, 1960); Vvedensky et al. Opred. Rast. Golodnoi Stepi 40 (Tr. Tashk. Gos. Univ. Vyp. 178; Bot.); Askerova in Fl. Azerb. VIII, 552; Kovalevskaja in Fl. Uzb. VI, 488.—*L. undulata* var. *pinnatipartita* Trautv. in Tr. Peterb. Bot. Sada, I, 1 (1871) 24; *L. undulata* var. *integrifolia* O. and B. Fedtsch. in Tr. Peterb. Bot. Sada, XXVIII, 1 (1908) 36, nom. nud.—*L. undulata* var. *integrifolia* C. Winkl. ex O. and B. Fedtsch. Perech. Rast. Turk. IV (1911) 321, nom. nud.—**lc.**: Ldb. op. cit. (1830) (color., bona); Kovalevskaja, 311 op. cit. Plate XLVIII, Fig. 3 (solum achenium).—**Exs.**: Kar. and Kir. Pl. Soongor. No. 320; Sintenis, It. transcasp.-pers. 1900–1901, No. 1612.

Annual. Stems (3) 10–30(60) cm high, solitary or few, more or less ribbed or sulcate, bifurcate above or from base, usually glabrous below (sometimes weakly pubescent above—visible under a hand lens!). Leaves almost undivided and sharply toothed to pinnately cut; lower leaves petiolate, sometimes rosulate; cauline leaves sessile, auriculate; upper leaves small, often undivided or subentire, more or less sinuate in lower half; leaves on terminal branches and peduncles inconspicuous. Capitula on short peduncles, with 8–12 florets, cylindrical or cylindrical-conical, about 20 mm long, narrowed near middle, in paniculate inflorescence. Involucral bracts three- or four-rowed; outer bracts densely pubescent, inner ones usually with distinct venation, more or less pubescent, subobtusate and almost always with reddish-violet spots. Corolla pinkish-violet or light blue. Achenes about 3.5 mm long and 1 mm wide, narrow-obovoid, yellowish-dark-brown, more or less flat, with one distinct longitudinal rib and transverse rows of sinuate folds, and with relatively thick hairs along ribs (distinct under high magnification, especially in the upper part of the achene); beak three to four times as long as achene, whitish, with pappus of numerous, very thin hairs in upper part, slightly longer than achene, slightly expanded at base and with two white rod-shaped pendent appendages on achene which float in water (as a result, beak seems apical on achene). Flowering April to July (August). (Plate XVIII, Fig. 5.).

At altitudes from a few hundred meters to 2,500 m; steppes and semideserts, loessy hills and gypsiferous deposits, shallow soils, rubbly and stony slopes, gravels, in dry ditches, sometimes as a weed in old fields, everywhere on more or less strongly saline soils.—*Caucasus*: Southern Transcaucasia, Talysh; *Western Siberia*: Upper Tobol, Irtysh, Altai, *Soviet Central Asia*: all regions. *General distribution*: Eastern Mediterranean, Balkans-Asia Minor (Turkey), Iran, Dzhungaria-Kashgaria (Kuldzha). Described from Semipalatinsk Region. Type in Leningrad.

Note. It is an extremely polymorphic species. According to the word of those who have seen it in nature, in one small area, growing side-by-side under apparently similar conditions, are plants 3–5 and 20–30 cm high; the sharp difference in growth vigor produces significant fluctuations in the nature of the branching, leaf form and other vegetative characters.

According to S. Kovalevskaja (op. cit., p. 489), at the junction of the range of *L. undulata* and *L. glauciifolia* forms of the first one (pubescent, with short appendages of the beak) are found which deviate from the type and apparently are of hybrid origin. She also reports *L. undulata* from the southeastern European part of the USSR, but I did not see specimens from there.

Species of Uncertain Position

19. *L. spinidens* Nevski in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. I, 4 (1937) 294; id. in Sorn. Rast. SSSR IV, 343 (descr. ross.); Kirp. in fl. Turkm. VII, 336.

Annual or biennial. Stem 50–130 cm high, whitish, rather thick (to 7–8 mm at base); more or less sulcate, in lower half covered with yellowish, horizontal, up to 5 mm-long spinules. Leaves glaucous-green, somewhat coriaceous; lower and middle cauline leaves elliptical or oblong-obovate, with rather dense spinules beneath along very prominent midrib, from subentire to coarsely and unevenly toothed, with cartilaginous spinules along margin, punctate-pitted beneath; upper leaves small, appressed to stem, semiamplexicaul, entire, densely pubescent beneath, with auriculate or sagittate base. Capitula in long compound racemose-paniculate inflorescence, cylindrical or narrow-campanulate, or about 20 florets and on peduncles mostly longer than capitula, covered with small papulose and densely pubescent scaly leaves, sometimes indistinctly merging into involucre bracts. Involucre bracts lax, usually four-rowed, triangular to lanceolate-linear, on outer surface more or less papulose and densely pubescent, obtuse, often with one or few violet spots; inner bracts with wide membranous sinuate border. Corolla pale or lemon-yellow. Achenes 3–3.2 mm long and 1–1.25 mm wide (dimensions according to Nevski), brown or light brown, narrow- or oblong-obovoid, with prominent longitudinal ribs (seven to nine on each side), covered with very short, upward-directed, somewhat stiff hairs (under a hand lens!), more distinct in upper part; achene apex attenuate into thin beak, concolorous with achene, beak about one and one-half times as long as achene, terminating in pappus of thin, white hairs, almost as long as beak. (Plate XVIII, Fig. 10.)

In wheat fields and on stony slopes.—*Soviet Central Asia*: mountainous Turkmenia, Pamiro-Alai (Kugitang). Endemic(?). Described from Kugitang. Type in Leningrad.

Note. The description is based entirely on a few specimens without fully mature achenes, which does not allow me to determine precisely the position of this species in the system of the genus.

- 313 *Lactuca spinidens* is similar to *L. aculeata* Boiss. and Kotschy ex Boiss. However, *L. spinidens* differs from the latter mainly by the nature of the leaves (having punctate pits on the lower surface, which are absent in *L. acauleata*, but then *L. acauleata* has a more or less conspicuous number of erect and stiff or stiffish hairs over the entire lower surface, which *L. spinidens* lacks); the more or less glabrous peduncles (densely glandular-hairy in *L. acauleata*), and other characters.

Grossheim twice reported *L. acauleata* from Transcaucasia (Fl. Kavk., Izd. 1-e, IV (1934) 257 and *Opred. Rast. Kavk.* (1949) 516), reliable in both cases, with the suggestion that his discovery needs confirmation. In the "Flora of Georgia," covering the territory from which this species has been reported, the name *L. acauleata* is missing. In the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, there is comparatively good material of *L. acauleata*, including two isotypes (Kotschy, Iter cilicicokurdicum 1859, No. 421). None of the specimens seen by us from the territory of the USSR can be identified as *L. acauleata*. Thus, this species should be excluded from the flora of the USSR.

20. ***L. mira*** Pavl in Byull. Mosk. Obshch. Isp. Prir. Otd. Biol. Nov. Ser. XLII, 2 (1933) 147,—**lc.**: Pavlov, op. cit. p. 147.

Perennial. Rhizome slender, creeping, terminating into slender and short vanishing stem, reaching 8–15 cm in height including leaves. Leaves two or few, on relatively long (usually about 5 cm) and wide, often intort, basally thickened petioles with entire or lyrate, oblong-ovate or ovate, flat or coriaceous lamina; lamina somewhat rugose, often reddish, finely appressed-hairy on both sides, spinose-toothed, often divided at base, obtuse or subacute. Capitula usually with 10 florets (8–13), cylindrical, with fruits 12–14 mm long, on axillary peduncles arising in groups of one or two (less often several); peduncles usually much longer than capitulum, with one to several reduced leaves resembling outer involucral bracts. Involucre usually three-rowed; involucral bracts dirty dark red, very finely pubescent dorsally (under a hand lens!), narrow membranous along margin, more or less obtuse; outer bracts sometimes somewhat squarrose, ovate or narrow-ovate; inner ones longer, linear- or triangular-lanceolate. Corolla pink. Achenes (according to Pavlov) all alike, glabrous, ribbed, slightly flattened, weakly narrowed toward both ends, apically expanded into a small disk; pappus snow-white, of equal, many-rowed, apparently smooth hairs (under high magnification, somewhat and non-uniformly barbed). Flowering August.

314 Upper mountain zone (altitude 3,500 m), on shifting, wet stony screes. *Soviet Central Asia*: Tien Shan (Talass Alatau Range). Endemic. Described from the Dzhebogly-Su River. Type in Moscow; isotype in Leningrad.

Note. A rare and most interesting plant. It is referred to the genus *Lactuca* only conditionally and temporarily until material with mature achenes can be studied. It is quite probable that this species ought to be referred not to *Prenanthes*, as proposed by Pavlov, but to the genus *Ixeris*.

Doubtful and Deleted Species

1. ***L. hybrida*** M. Pop. ex Zak. in Tr. Uzb. Gos. Univ., Nov. Ser.

No. 89 (1958) 166, nomen; Zakirov, Fl. i Rastit. Bass. Zeravsh. II (1961) 428, nomen.

A plant growing in the "chul" zone on gypsiferous buttes and in the "tau" zone on saline stony slopes of terraces has been reported under this name. A description is lacking. K.zakirov (1961) notes in parentheses: N."? *L. undulata* × *L. glaucifolia*." It is mentioned in the Flora of Uzbekistan (Vol. VI, 1962).

2. **L. kochiana** Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 115 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 17); Schchian in Fl. Gruzii VIII, 684.—*Mulgedium salicifolium* C. Koch in Linnaea XXIII (1850) 669; Boiss. Fl. or. III, 802.—*Lactuca salicifolia* Grossh. Fl. Kavk. IV (1934) 255 and Opred. Rast. Kavk. 516, non *L. salicifolia* Salisb. Prodr. stirp. (1796) 180.

Perennial. Root? Creeping rhizomes absent. Stem 75–120 cm high, erect, weakly branched above. Leaves glaucous, narrow-elliptical or lanceolate, shallow runcinate or entire, emarginate or fine-toothed; lower leaves short-petiolate, others sessile. Capitula cylindrical, in racemose-paniculate inflorescence; peduncles short, with scaly leaves. Involucral bracts reddish, membranous along margin; outer bracts ovate, noticeably shorter than inner, almost linear bracts. Corolla dark blue. Achenes shortly narrowed into beak, brown. Flowering June to August.

Dry rocky and sandy places in middle and upper mountain zones.—*Caucasus*: Eastern Transcaucasia (Meskhetia). *General distribution*: Armenia and Kurdistan (former Olty District). Described from Daik (Turkey). Type was in Berlin and probably was lost.

Note. The Herbarium of the Botanical Institute, Academy of Sciences of the USSR, does not have the authentic material of this species. The description given here is based only on the literature.. No botanist has so far seen fully mature achenes, which prevents this species from having a firm position in the classification. C. Koch referred his own species to true *Mulgedium*, but compared it with the present *Cicerbita prenanthoides*. Careful new collections are urgently needed.

315 3. **L. lipskyi** Schischk. ex Grossh. Opred. Rast. Kavk. (1949) 516 (diag. brev. ross.)

It is not a validly described species, which must be mentioned because this name has been used in the widely known manual of A.A. Grossheim. The plant is said to be endemic to the Cherkessia region, where it is found along the sea coast and, according to Grossheim, has the following characters: biennial, up to 60 cm high, strongly branched, branches long, virgate; lower leaves deeply divided into narrow, oblong lobes, upper leaves strongly decurrent; capitula with 8–12 florets; corolla yellow; beak of achene black.

I was unable to see the authentic material, but judging from the specimens studied, the Black Sea Coast of western Transcaucasia does not have a unique species of its own. Most probably, specimens of *L. chaixii* deviating somewhat from the norm were taken for *L. lipskyi*.

4. ***L. perennis*** L. Sp. pl. (1753) 796.

This plant, described from Europe, was reported for Russia by Ledebour (Fl. Ross. II, 2 (1845–1846) 802) for his "Central Russia" region, in particular: "Livonia: in montosis p. Wanden (Fisch.) Warsawia (Erndt)." Subsequently, Schmalhausen (Fl. Sredn. i. Yuzhn. Ross. II (1897) 167) wrote that *L. perennis* is "reported from the Minsk Province." However, Fedtschenko and Flerow (Fl. Evrop. Ross. (1910) 1057) noted that the reported occurrence of this species "needs confirmation." Stankov and Taliev in their book (Opred. Vyssh. Rast., 2nd ed. (1957) 442) again mentioned *L. perennis* for the Minsk Region, but in the Flora. BSSR (Vol. V, 1959) Mikhailovskaja did not mention this species. There is no material in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR that could be identified with *L. perennis* L.

5. ***L. quercina*** L. Sp. pl. (1753) 795; Ldb. Fl. Ross. II, 2, 806; Schmalh. Fl. II (1897) 168 (incl. var. *sagittata*, *stricta* and *armena*) Fedtsch. and Fler. Fl. Evrop. Ross. 1059.

I could not establish the identity of *L. quercina* L. This species was described by Linnaeus from an island in the Gulf of Bothnia ("Habitat in insula Carolina Balthici"), which now carries the Finnish name Hailuoto, and earlier carried the Swedish name of Karlö Island).

DeCandolle (*Prodr.* VII, 1 (1838) 138, No. 36) alluded to the doubtful status of this species ("Planta... forte dubia"). "Index Kewensis" indicates that *L. quercina* L. is found in southern Europe and the Caucasus ("Europe austr., Reg. Cauc."), i.e., in regions having no relationship to the *locus classicus*. On the other hand, assuming that a unique *Lactuca* species exists in the Gulf of Bothnia, it can hardly be expected to reappear, after a large gap, in southern European USSR and the Caucasus. However, it must be mentioned for the sake of objectivity that western floristic
316 botanists usually recognize *L. quercina*, and, besides, most treat this species very broadly, including *L. chaixii* and *L. stricta* as subspecies (or varieties).

Possibly, Linnaeus described *L. quercina* from the extreme northern outpost for the species, and then at least *L. stricta* Waldst. and Kit. becomes a synonym of *L. quercina* L.

6. ***L. querna*** Pall. Bemerk. Reise in die Südl. Statth. d. Russ. Reichs I (1799) 221, solum nomen.

In section "Astrachanische Weinbau," Pallas opens the list of

commonly occurring plants with "wild Salat (*Lactuca querna*).” Ledebour ignored this name of Pallas. Trautvetter (*Tr. Peterb. Bot. Sada* VIII, 2, 1883, *Increm. fl. phaenog. Ross. fasc. II*, p. 521, Nov. 3247) quite categorically states that the plant of Pallas is nothing other than *L. quercina* L. In *Index Kewensis*, this same opinion was also expressed, with a question mark. The real difficulty is that *L. quercina*, as understood by the older Russian authors from the Astrakhan area, is as yet not known. Most probably, Pallas saw a wild specimen of cultivated lettuce, but this question can be resolved finally only after examining the authentic specimen.

7. *L. spectabilis* Fisch. and Mey. ex. Sch. Bip. in Herb. et Winkl. Jahrb. Pharm. IV (1841) 154, in nota (vidi tantum seorsum impressum sub titulo "Skeleton systematis articulati Cichoriacearum," p. 4).

Schultz, making the new combination *Wiestia spectabilis* (Fisch. and Mey.) Sch. Bip., took *Lactuca spectabilis* Fisch. and Mey. as the basionym. It can be established by indirect information that a plant of *L. serriola* was considered under this name. So far I have not been able to establish precisely what *L. spectabilis* is and from where it was described. The name *L. spectabilis* is not mentioned in "Index Kewensis."

8. *L. tephrocarpa* C. Koch in Linnaea XXIII (1850) 672.

This species was described by C. Koch from Georgia. However, it has not been mentioned subsequently by Russian investigators of the flora of Caucasus (Lipsky, Grossheim and others). Probably, one has to agree with Boissier (who had seen the material of Koch) and the authors of "Index Kewensis" that *L. tephrocarpa* is not different from *L. serriola*.

9. *L. virosa* L. Sp. pl. (1753) 795 and ed. 2 (1763) 1119; DC. Prodr. VII, 1, 137; Ldb. Fl. Ross. II, 2, 805; Schmalh. Fl. II, 167; Fedtsch. and Fler. Fl. Evrop. Ross. 1058; Kraschen. in Fl. Yugo-Vost. VI, 470; Szafer, Kulcz., B. Pawl. Rośl. Polskie (1953) 743; Kirp. in Majevski, Fl. (1954) 633; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2, 1122; Dostál, Klíč (1954) 801; Stank. and Tal. Opred. Vyssh. Rast. (1957) 443.—Mikhailovskaja in Fl. BSSR, V, 191.—*Wiestia virosa* Sch. Bip. in Herb. et Winkl. Jahrb. Pharm. IV (1841) 154, in nota (vidi tantum seorsum impressum sub titulo "Skeleton systematis articulati Cichoriacearum," p. 4).—*Id.*: Hegi, op. cit. 1123, fig. 800.—*Exs.*: Sch. Bip. Cichoriaceothesca, No. 82; Kickxia Belgica, No. 329.

Ledebour cited this species only on the basis of the published reports of Falk (Volga below Kazan), Georgi (Saratov), and Uspensky (Sverdlovsk). Ledebour did not see specimens ("Specimina rossica nodum vidi"). Schmalhausen indicates an apparently rather wide distribution of

this species (Lithuania, Belorussia, Ukraine, and even Turkestan!). This opinion of Schmalhausen, based on imprecise identifications, was repeated by Fedtschenko and Flerow and, among the later authors, Stankov. Other Soviet taxonomists (Krascheninnikov, Mikhailovskaja and others) generally cited this species with various cautions, emphasizing the need to confirm the locality of *L. virosa* or indicating that they did not see herbarium specimens.

All specimens, that we were able to examine in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, with the name *L. virosa* L. were simply wrongly identified plants (most of these belong to *L. serriola*). Thus, at present there is no basis to consider *L. virosa* as growing within the territory of the USSR.

GENUS 1655. *Scariola* F.W. Schmidt^{1,2}

F.W. Schmidt, Samml. phys.-ökonom. Aufs. I (1795) 270 (non vidi!); Soják in Novit. bot. Horti bot. Univ. Car. Prag. (1962) 41, 46.—*Phaenixopus* Cass. in Dict. sc. nat. XXXIX (1826) 391.—*Phaenixopus* Rchb. Consp. (1828) 98.—*Phaenopus* DC. Prodr. VII, 1 (1838) 176.—*Lactuca* sect. 2. *Phaenixopus* Benth in Benth and Hook. f. Gen. Pl. II (1873) 525, p. p.—*Lactuca* sect. *Quinqueflorae* Boiss. Fl. or. III (1875) 805, p. p.—*Phaenopus* DC. Num. Consp. Fl. Europ. II (1879) 435.—*Lactuca* subgen. *Phaenixopus* Babcock, Stebbins and Jenkins in Cytologia, Fujii Jubil. Vol. (1937) 191, solum. nomen.

Capitula homogamous, mostly five-flowered, cylindrical, borne in spicate-panicles or spicate inflorescence. Involucre three- or four-rowed; bracts herbaceous, innermost membranous along margin, subobtus. Corolla yellow. Achenes mostly flattened, pubescent with more or less numerous (usually five to seven or seven to eight) prominent longitudinal ribs (under a hand lens!), apically attenuate into long beak-like structure, or only in narrow throat-like structure sometimes achenes narrowed almost equally on both sides, narrow-ellipsoid, with distinct or indistinct
318 narrowing at apex. Pappus of numerous, fine, fragile hairs. Basic chromosome number in cytologically studied species is $x = 9$.

Type of genus: *Scariola viminea* (L.) F.W. Schmidt.

Biennial and perennial herbs or semishrubs, usually growing in arid regions, often on stony places.

¹ Treatment by M.E., Kirpicznikov.

² A new Latin word derived from the local Italian name *scariola*, used for salad plants, including also species of the genus *Lactuca* s. l.

The genus comprises about 10 species, growing in the Old World: in the USSR mainly in the Caucasus and Soviet Central Asia, as also in the southern half of the European Part; outside the USSR, in Europe (especially in the Mediterranean countries), Asia Minor, Southwest Asia (Turkey, Syria, Lebanon, Iran etc.), Afghanistan and, possibly, the Himalayas and Tibet.

In the structure of achene, *Scariola* species are close to the members of subgenus *Lactucopsis* of the genus *Lactuca*, as its narrowed apex, even if appearing like a beak, is not structurally separated and is simply the apical part of the achene. However, the structure of the vegetative organs, ecology and also the few-flowered capitula (with practically a fixed number of florets), clearly distinguish the *Scariola* species from *Lactucopsis*.

1. Achenes dark violet or blackish, apically attenuate into long beak-like part. Biennial or perennial plants 1. ***S. viminea*** (L.) F.W. Schmidt.
- + Achenes brown- dark brown or yellowish 2.
2. Achenes 7–8 mm long 2. ***S. orientalis*** (Boiss.) Soják
- + Achenes 2.5–3 mm long 3. ***S. albertoregelia*** (C. Winkl.) Kirp.

1. ***S. viminea*** (L.) F.W. Schmidt, Samml. phys.- ökonom. Aufs. I (1795) 270.—*Prenanthes viminea* L. Sp. pl. (1753) 797; M.B. Fl. taur.-cauc. II, 244.—*Phoenixopus vimineus* Rchb. Fl. Germ. excurs. II (1831) 272; Sosnowsk. in Takht. and Fed. Fl. Erevana (1945) 339 (sub *Phaenioxopode vimineo*).—*Prenanthes ramosissima* All Fl. Pedem. I (1785) 226.—*Chondrilla sessiliflora* Lam. Fl. Fr. II (1778) 104.—*C. viminea* Lam. Encycl. méth. II (1786) 77.—*Phaenioxopus decurrens* Cass. in Dict. sc. nat. XXXIX (1826) 391, p. p.—*Lactuca viminea* J. and C. Presl. Fl. Čech. (1819) 160; Schmalh. Fl. II, 169; Fedtsch. and Fler. Fl. Evrop. Ross. Fl. 1058; Grossh. Fl. Kavk. IV (1934) 256 and Opred. Rast. Kavk. 516; Kraschen. in Fl. Yugo-Vost. VI, 470; Klok. in Vizn. Rosl. URSR, 604; Schchian in Fl. Gruzil VIII, 691; Hegi, Ill. Fl. 2 Aufl. VI, 2, 1129; Dostál, Klíč. 802; Kirp. in Majeovski, Fl. (1954) 632; Stank. and Tal. Opred. Vyssh. Rast. (1957) 442; Askerova in Fl. Azerb. VIII, 556.—*Phaenopus vimineus* DC. Prodr. VII, 1 (1838) 176.—*Lactuca viminea* Sch. Bip. ex. W.D. Koch Taschenb. d. Deutsch. u. Schweiz. Fl. (1844) 317; Ldb. Fl. Ross. II, 2, 804.—**Ic.**: All. op. cit. t. XXXIII, fig. 1 (sub *Prenanthe ramosissimo*); Rchb. f. Ic. fl. Germ., et Helvet. XIX (1859), 319 t. 67 (MCCCCXVIII), fig. 1–9 (sub *Lactuca viminea* ut omnia sequen.); Javorka and Csapody, Iconogr. fl. Hungar. (1933) t. 561, fig. 4025 (bona); Hegi, op. cit. 1129; fig. 806 (achenium non exacte delineatum); Dostál,

op. cit. 803, fig. 2221.—**Exs.:** Rchb. Fl. Germ. exs. No. 598 (sub *Phaenioxode vimineo*); Sintenis, It. trojanum 1883, No. 476; Ej. It. transcasp.-pers. 1900–1901, No. 1002; Ross, Herb. Siculum, No. 554 (tria ultima sub *Lactuca viminea*).

Biennial (or perennial?). Root woody, long, more or less vertical. Stem 30–60(80) cm high, glabrous, light colored (straw-yellow or whitish), branched from middle or base, with long and slender, virgate branches, less often stem simple. Leaves, especially upper ones, finely tomentose (under a lens!); basal and lower cauline leaves early-withering, pinnatipartite or pinnatisect, with lobes or segments usually linear-lanceolate, somewhat toothed or entire; other leaves sessile, usually linear, entire, decurrent, with long, linear bases (auricles) extending downward, distinguished by their green stripes on light-colored stem. Capitula with five florets, cylindrical, or almost cylindrical, with fruits up to 22 mm long, in groups of few or solitary, in spicate-panicles or spicate inflorescence, mostly sessile; terminal capitula often on long peduncles, with scaly leaves. Involucre usually four-rowed, involucre bracts herbaceous, greenish, finely appressed hairy on dorsal surface (under a hand lens!), from short, triangular-ovate outer bracts to longer and linear inner with membranous border, subobtusate. Corolla yellow. Achenes flattened, with rather numerous (usually seven to nine), prominent longitudinal ribs, dark violet or blackish, covered with numerous short and stiff hairs (under high magnification!); lower, relatively broad, ellipsoidal part of achenes about 5 mm long and up to 1 mm wide, gradually attenuate upward, forming beak-like structure bearing light-colored disk with pappus; total length of achene with beak-like structure 12–14 mm; pappus of numerous white, fine, silky, somewhat barbed (under a hand lens!), fragile, 5–6 mm long hairs. $2n = 18$. Flowering June to September. (Plate XXIII, Fig. 2.).

Forest-steppe and steppe regions in stony and weedy places; in lower and middle mountain zones on stony and rubbly slopes and on screes.—*European Part:* Volga-Kama (Tatar ASSR), Trans-Volga Region, Bessarabia, Black Sea Region, Crimea, Lower Don; *Caucasus:* Ciscaucasia, Eastern, Western, and Southern Transcaucasia, Talysh; *Soviet Central Asia:* mountainous Turkmenia (less often). *General distribution:* central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, Armenia and Kurdistan, Iran. Described from France and Portugal. Type in London.

Note. The information about its distribution in the European USSR, except for the territory of Crimea, comes only from published sources.

320 Localities in Soviet Central Asia as well as outside the USSR need to be confirmed.

2. **S. orientalis** (Boiss.) Soják in Novit. bot. Horti bot. Univ. Car. Prag. (1962) 46.—*Phaenopus orientalis* Boiss. Voy. Bot. Esp. II (1839–

1845) 390, in nota; Nevski in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4 (1937) 294; Zakirov, Fl. i Rastit. Bass. Zeravsh. II, 427.—*Phaenixopus decurrens* Cass. in Dict. sc. nat. XXXIX (1826) 391, p. min. p.—*Lactuca viminea* Sch. Bip. β. *erostris* Rgl. in Bull. Soc. Nat. Mosc. XL, II, 3 (1867) 173.—*L. viminea* Sch. Bip. var. *leucocarpa* Trautv. in Tr. Peterb Bot. Sada II, 2 (1873) 559.—*L. orientalis* Boiss. Fl. or III (1875) 819; O. and B. Fedtsch. Perech. Rast. Turk. IV, 332 (Consp. Fl. Turk. No. 2789); Grossh. Fl. Kavk. IV (1934) 256 and Opred. Rast. Kavk. 516; Kirp. in Fl. Turkmen. VII, 438; Kitam. in Res. Kyoto Univ. Exp. Karak. a. Hinduk. 1955, 430 (Fl. of Afghanistan, 1960); Askerova in Fl. Azerb. VIII, 556; Kovalevskaja in Fl. Uzb. VI, 483.—*Mulgedium orientale* (Boiss.) M. Pop. in Tr. Uzbek. Gos. Univ. Nov. Seriya, No. 27, Biol. Vyp. 14 (1941) 104.—*Phaenixopus orientalis* Nevski ex M. Pop. ibidem, nom. in synonym.—*Phaenixopus orientalis* Boiss. ex Sosn. in Takht. and Fedtsch. Fl. Erevana (1945) 339.—**IC.**: Bouloumoy, Fl. Lib. et Syr. (1930) t. 226, fig. 4 (phot., mediocr., sub *Lactuca orientali*).—**Exs.**: Kotschy, Pl. Pers. austr. No. 702 (sub *Phaenopode orientali*); Bornm. It. pers.-turc. (1892–1893), No. 4120 (sub *Lactuca orientali*); Bornm. It. pers.-turc. (1892–1893), No. 4120 (sub *Lactuca orientali*, ut ulteriora); Sintenis, It. or. 1890, No. 2782 and It. or. 1892, No. 4785; Ej. It. transcasp.-pers. 1900–1901, Nos. 587b, 919a and b, 1090; GRF No. 1885.

Perennial. Semishrub with somewhat strong, woody, fibrous branched roots. Plants divaricately branched from base. Stems (10) 20–60 cm high, woody below, glabrous or subglabrous; branches stiff, virgate, sometimes sulcate, whitish to snow-white, with green striations of decurrent bases of leaves, apical leaves often spinescent. Leaves glaucous-green, rather dense, subglabrous (under high magnification, finely appressed-hairy); lower leaves (early-withering) pinnatipartite or pinnatisect, with two to four pairs of usually triangular lobes or segmens and long, linear, acuminate apex, narrowed toward base into broad semiamplexicaul petiole; other leaves sessile, decurrent with long, narrowly linear bases (auricles), fused with stem; middle cauline leaves with laminas like lower leaves in shape, upper linear, entire. Capitula usually with five-florets, narrowly cylindrical, with fruits 8–14 mm long, solitary, or, less often, in groups of few, on branches in spicate or spicate-paniculate inflorescence, usually sessile or terminal on more or less long peduncles covered with scaly leaves. Involucre three- or four-rowed; involucre bracts herbaceous, green to (partly or wholly) violet; outer bracts ovate, densely fine tomentose on dorsal side, inner
 321 ones much longer, with membranous border, subobtus. Corolla yellow. Achenes 7–8 mm long and 1–1.25 mm wide, narrowly ellipsoid, flattened, brown, drark-brown or yellowish, less often dirty dark red, with five to seven longitudinal ribs (some not always prominent), covered with very short hairs (under a lens!), apically attenuate into short (sometimes

indistinct), narrow, throat-like structure bearing light-colored disk with pappus; pappus of numerous white, fine, silky, somewhat barbed (under a hand lens!), fragile hairs, as long as achene or slightly shorter. $2n = 36$. Flowering June to September(October). (Plate XXIII, Fig. 1.).

Foothills and mountains up to 3,800 m; on clayey and loamy soils, lime deposits and shales, dry rubbly and stony places, mostly on slopes and scree, as well as on gravels and in dry ravines.—*Caucasus*; Southern Transcaucasia, Talysh: *Soviet Central Asia*: Kyzyl-Kum Kara-Kum, mountainous Turkmenia, ?Amu-Darya, Syr-Darya, Pamiro-Alai, Tien Shan. *General distribution*: Mediterranean, Balkans-Asia Minor (Asia Minor), Armenia and Kurdistan, Iran, Indo-Himalayas (Himalayas; literature records), Tibet (literature records). Described from southwest Asia. Type in Geneva.

Note. A highly polymorphic species, but so far not yielding to division into well-defined races. Within Soviet Central Asia, individual specimens of *S. orientalis* differ markedly from each other both in size and growth habit: some plants are relatively tall and lax, while others are almost pulvinate and produce forms with numerous, slender, very dense, often more or less entangled and spinose branches; these dwarf forms also differ by having relatively short capitula and almost violet involucre bracts. However, I did not find specimens with mature achenes, in the absence of which it is difficult to judge the taxonomic significance of such plants. Most likely, this is simply an alpine variant of *S. orientalis*. In a series of Mediterranean plants, especially those growing in the Gornyi Badakhshan, small pads consisting of clusters of white arachnoid silky hairs are observed at the base of the expanded dead petioles of the lower leaves.

However, the plants growing in the western Tien Shan deserve special attention. Two sheets preserved in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, have the following label: "Compositae. *Lactuca pseudorientalis* M. Pop. sp. n. Middle reaches of Kok-Su, granite scree." This whole label, as Linczevsky kindly informed me, was written by O.K. Smirnova, the wife of M.G. Popov. On the same label, in Gorshkova's hand, is the postscript: "collected by O.K. Smirnova." These specimens differ from others by having a relatively large number of rows (five to seven) of greenish involucre bracts (quite distinct in young capitula) as well as crowded capitula and almost green branch tips because of leaves densely covering their bases. Unfortunately, the absence of
322 mature achenes does not allow us to express a firm opinion about "*L. pseudorientalis*," but it appears that this is only a form of *S. orientalis* and not a separate race.

The specimens from Badkhyz (collections of I.A. Linczevsky from the Gyaz-Gyadyk Range, 1930) also attract attention by their general

morphology. The secondary branches are particularly strongly branched above, the involucral bracts are mostly four- or five-rowed, and leaf bases on fully mature specimens are almost unnoticeable. However, the achenes are practically indistinguishable from typical *S. orientalis*.

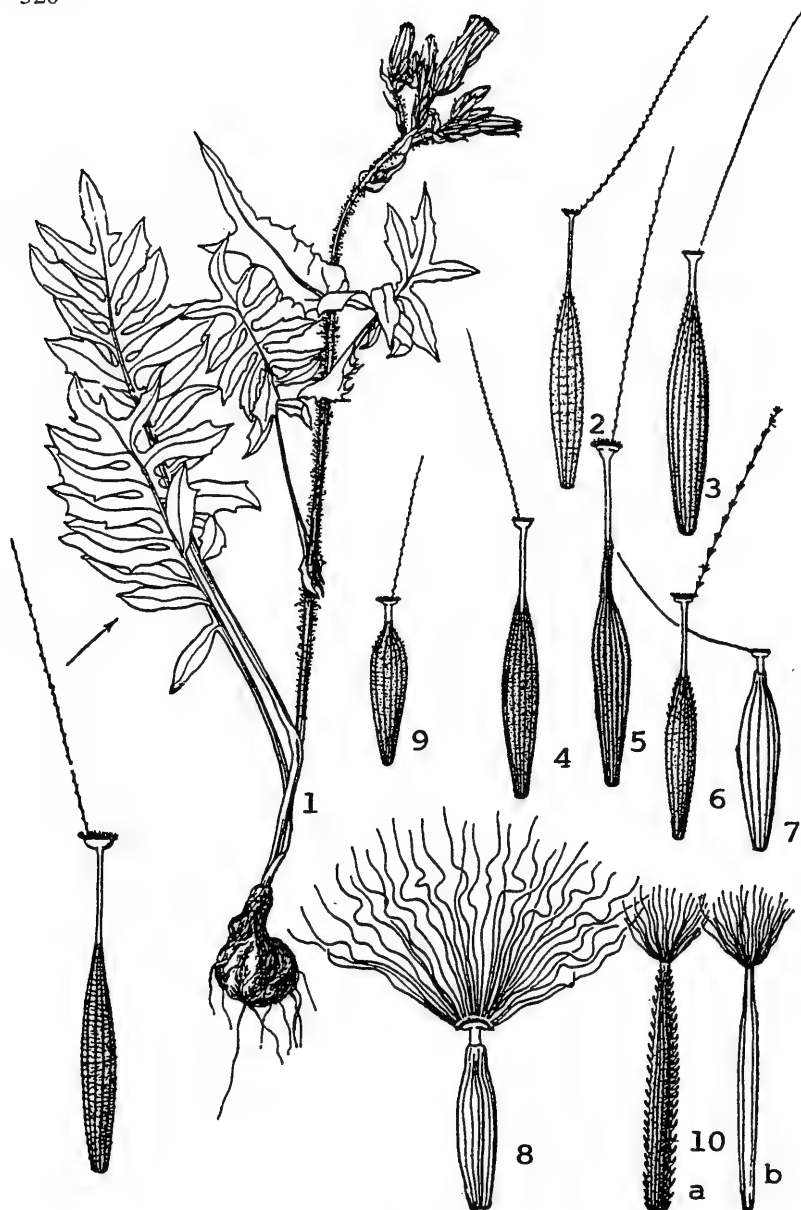
The aforesaid speaks to the need for a more detailed study of *S. orientalis* s. l. in the field; also desired are new collections of complete specimens with mature achenes.

3. *S. albertoregelia* (C. Winkl.) Kirp. comb. nova.—*Chondrilla albertoregelia* C. Winkl. in Tr. Peterb. Bot. Sada XI, 10 (1890) 337 (seorsum impressum; in volumino completo XI, 2 (1892) 337); O. and B. Fedtsch. Perech. Rast. Turk. IV, 323 (Consp. Fl. Turk. No. 2795).—*Crepis* aff. *multicaulis* Iljin in Byull. Otdel. Kauchukon. 3 (1930) 61.

Perennial. ? Plants 20–30 cm high, with dead remnants of membranous sheaths of lower leaves at base, mostly covered with malpighian or stellate hairs. Stem slender, virgate, branched from base, glabrous or subglabrous, sometimes with stellate hairs only in lower part. Lower leaves oblong-lanceolate or oblong-linear, narrowed into winged petiole, merging with narrow-triangular sheath-like base; cauline leaves sessile, narrow-linear to subulate, inconspicuous, scaly at stem apices. Capitula with five florets, cylindrical, with fruits 6–7 mm long, solitary at apices of slender branches, far exceeding capitula. Involucre (two) three- or four-rowed; involucral bracts herbaceous, brownish, inner bracts usually five, much longer than outer, with membranous border, subobtusate. Corolla yellow(?). Achenes 2.5–3 mm long and 0.3 mm wide, smooth or almost so, slightly flattened or not, brown-dark brown, usually with five prominent
324 longitudinal ribs, apically attenuate into beak-like structure (about 0.5 mm long), bearing broad disk with pappus of thin, white, somewhat barbed (under a hand lens!), usually fragile hairs, slightly longer than achene. Fruiting September.

Valleys of mountain rivers to altitudes of 2,000–2,500 m. *Soviet Central Asia*: Pamiro-Alai (Darvaz). Endemic. Described from Darvaz. Lectotype and paratypes in Leningrad.

Note. Described on the basis of a small number of authentic specimens, among which there are no capitula with florets, and the achenes are clearly immature. Therefore, the taxonomic status of this species, particularly, the assigning of it to the genus *Scariola*, remains doubtful. However, it is clear that *S. albertoregelia* cannot remain in the genus *Chondrilla*, to which K. Winkler refers it, nor in *Crepis* as proposed by Iljin. Based on achene structure, the plant examined is close to species of *Lactuca* L. s. l., including also *Scariola*. It differs from the typical members of the latter genus by its leaf structure and particularly by the nature of the hairs on the sheaths of the lower leaves; the hair type (malpighian or



1—*Cephalorrhynchus kirpicznikovii* Grossh., habit of plant, achene; 2—*C. tuberosus* (Stev.) Schchian, achene; 3—*C. talyschensis* Kirp., achene; 4—*C. soongoricus* (Rgl.) S. Kovalevsk., achene; 5—*C. kossinskyi* (Krasch.) Kirp.; 6—*C. subplumosus* S. Kovalevsk., achene; 7—*C. takhtadzhianii* (Sosn.) Kirp., achene; 8—*C. polycladus* (Boiss.) Kirp., achene; 9—*Mycelis muralis* (L.) Dum., achene; 10—*Lagoseriopsis popovii* (Krasch.) Kirp., achenes: a) outer; b) inner.

stellate) alone sharply differentiates this species from the other members of the genus *Lactuca* L. s. 1.

GENUS 1656. *Steptorhamphus* Bge.^{1,2}

Bge. in Beitr. z. Kennth. Fl. Russl. u. Stepp. Centr.-As. i.e. Alexandri Lehmann reliq. bot. etc. (1851) 205 (seorsum impressum) and in Mém. Sav. Etr. Pétersb. VII (1854) 381.—*Lactuca* sect. 4. *Cicerbita* Benth. in Benth. and Hook. f. Gen. Pl. II (1873) 526, p. min. p.—*Lactuca* sect. *Tuberosae* Boiss Fl. or. III (1875) 804.—*Cicerbita* §5. *Steptorhamphus* Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 117 (seorsum impressum, Contrib. a l'étude des Compos. III, p.19).

Capitula homogamous, with (15)25–35(50) florets relatively large (with fruits up to 40 mm long), cylindrical, narrow-campanulate or oblong, in corymbose, corymbose-paniculate, racemose or racemose-paniculate (sometimes as if candelabriform), inflorescence. Involucral bracts imbricate, usually three- or four-rowed; innermost bracts two times or more as long as outer ones, usually linear, with membranous border. Receptacle smooth. Anthers oblong-linear, with rather long, appressed, more or less sagittate basal appendages. Style and its branches densely covered with pointed, upward-directed, short hairs. Achenes somewhat ellipsoid or lanceolate, less often oblong, flattened to completely flat, with one or three, more or less distinct, ribs on each side, densely covered with very short, transverse, sinuate rows of light-colored hairs (under a hand lens!), mixed with isolated, relatively long (white and transparent), papilliform hairs perpendicular to achene surface; beak thin, usually
325 yellowish-green. Pappus persistent, of short outer corona (under a hand lens!) and inner rows of white, relatively long, thin, silky, more or less smooth hairs (under high magnification, somewhat barbed), outer corona of numerous hairs in few or many rows, lemon-colored or golden, or only of more or less dense, sometimes distinctly reduced, ring of white transparent hairs not always conspicuous (under a lens!).

Type of genus: *Steptorhamphus crambifolius* Bge.

The genus comprises about 10 species of perennials with thick and often lignified roots. Plants almost exclusively growing in Soviet Central Asia and the Caucasus; one species in Crimea; outside the USSR, found in Afghanistan, Pakistan, Iran, Turkey, and in the Mediterranean.

In the original description, Bunge compared his new genus with *Lomatolepis* Cass. Actually, *Lomatolepis* is relatively distant from

¹ Treatment by M.E. Kirpicznikov.

² From the Greek words *stepto* [sic; *strept*]=twisted, and *ramphos*=beak.

Steptorhamphus, which is phylogenetically related to *Lactuca* and *Cicerbita*.

1. Beak shorter than achene 2.
- + Beak as long as achene or longer 3.
2. Involucral bracts (and also peduncles) covered with glandular hairs 2. ***S. crassicaulis*** (Trautv.) Kirp.
- + Involucral bracts, at least outer, finely appressed-hairy, but without glandular hairs 1. ***S. crambifolius*** Bge.
- 3(1) Peduncles glandular-hairy; outer corona of pappus consisting of more or less numerous, often many-rowed, usually golden or lemon-yellow, short hairs (under a hand lens!) 3. ***S. persicus*** (Boiss) O. and B. Fedtsch.
- + Peduncles without glandular hairs; outer corona of pappus usually consisting of incomplete row or of fewer, short, white hairs, not always conspicuous (under a hand lens!) 4.
4. Corolla light blue-purple or light blue-lemon-colored; beak filiform, two and one-half to three times as long as achene 4. ***S. tuberosus*** (Jacq.) Grossh.
- + Corolla yellow or beak shorter 5.
5. Middle cauline leaves undivided, with shallow incisions; peduncles rather slender (immediately below capitulum, 0.5–1 mm wide). Plants so far known only from southern Transcaucasia 7. ***S. czerepanovii*** Kirp.
- + Middle cauline leaves with lamina more or less divided, often runcinate 6.
6. Basal (lower) and middle cauline leaves runcinate, densely tomentose (under a lens!); basal leaves with more or less numerous hairs beneath along with their thick midrib. Plants of the Caucasus. 5. ***S. petraeus*** (Fisch. and Mey.) Grossh.
- + Basal (lower) and middle cauline leaves undivided, more or less coarsely toothed-spinose, less often pinnatilobate and pinnatipartite to almost runcinate, finely appressed hairy (under high magnification!). Plants from Turkmenia 6. ***S. linczevskii*** Kirp.

Section 1. *Steptorhamphus*.— Outer corona of pappus usually of numerous lemon-colored or golden-yellow hairs in a few or many rows; hairs on achene all alike. Projections on the aerole of disk usually somewhat flat.

Type of section: type of genus.

1. ***S. crambifolius*** Bge. in Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As. i. e. Alexandri Lehmann reliq. bot. etc. (1851) 205 (seorsum

impressum) and in Mém. Sav. Etr. Pétersb. VII (1854) 381; O. and B. Fedtsch. Perech. Rast. Turk. IV, 319 (Consp. Fl. Turk. No. 2777); Kovalevskaja in Fl. Uzb. VI, 492.—*Lactuca crambifolia* Boiss. Fl. or. III (1875) 806; B. Fedtsch. Rastit. Turk. 765.—*L. crambifolia* (Bge.) M. Pop. in Tr. Uzb. Gos. Univ. Biol. Vyp. 14 (1941) 109 (in appendix).—*Cicerbita crambifolia* Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 143 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 45, No. 50); Vvedensky et al. Opred. Rast. Golodnoi Stepi 40 (Tr. Tashk. Gos. Univ. Vyp. 178, Bot.).—**lc.**: Kovalevskaja, op. cit. Plate XLIX, Fig. 2.

Perennial. Root 1–1.5(3) cm thick, sometimes branched. Stems (15)30–40(50) cm high, glabrous or almost so, sulcate, fistular, usually branched from middle or above producing auxillary floriferous branches. Leaves glaucous, rather dense, often with violet tinge; basal leaves often rosulate at stem base, elliptical or oblong-obovate, usually up to 25–30 cm long and 4–7 cm wide, undivided to pinnatilobate and pinnatipartite, or sinuate on margin, in both cases spinulose along margin, with thick midrib expanded downward and merging with still broader petiole; cauline leaves much smaller than basal, oblong-elliptical, spatulate or lanceolate, usually undivided, less often somewhat incised or divided, on broad semiamplexicaul petiole or sessile; uppermost leaves strongly reduced (on peduncles scaly), sessile, semiamplexicaul, with auriculate base. Capitula with 15–25(30)- florets, almost cylindrical, with fruits 17–20 mm long, in more or less divaricate corymbose or corymbose-paniculate inflorescence at apices of unequal peduncles, often shorter than capitula. Involucral bracts three- to four-rowed, sometimes with deflexed and divergent apices, very finely and densely pubescent dorsally, often violet; outer bracts oblong-ovate and cordate, inner ones linear-lanceolate or linear, subobtusate and with barbula of thin hairs. Corolla bright yellow, often lilac-colored or with lilac streaks on outer surface. Achenes ellipsoid or acute-ellipsoid, 5–7 mm long and 2–2.5 mm wide, with one prominent longitudinal middle rib and two, more or less distinct, lateral ribs; mature achenes dark-brown, dark violet or almost black, densely covered with very short sinuate-transverse light-colored hairs (under high magnification!), apically attenuate into greenish-yellow, thin, 3 mm long beak terminating in funnel-shaped disk bearing pappus; outer corona of pappus of numerous short, lemon-colored or golden-yellow hairs (under a hand lens!), in a few or many rows; white hairs of inner row 7–11 mm long. Flowering (April) May to June(July). (Plate XIX, Fig. 3.)

On outcrops of conglomerates and gypsiferous rocks, in crevices of granite and limestone rocks, stony and rubbly slopes.—*Soviet Central Asia*: Kyzyl-Kum, ?Amu-Darya, Pamiro-Alai, Tien Shan. *General distribution*: possibly in Afghanistan. Described from Soviet Central Asia, outlier mountains in Kyzyl-Kum desert. Type in Leningrad.

Note. Specimens from Tadzhikistan differ from typical specimens by having more slender peduncles, a strongly branched corymbose inflorescence, slightly narrower achenes (usually dark olive-colored), and a few other "minor" characters. Possibly, additional materials may lead to splitting off the plants from Tadzhikistan as a separate race.

2. *S. crassicaulis* (Trautv.) Kirp. comb. nova.—*Mulgedium* ? *crassicaule* Trautv. in Bull. Soc. Nat. Mosc. XXXIX, I, 2 (1866) 309 (Enum. pl. songor No. 721).—*Streptorhamphus hispidulus* Rgl. in Bull. Soc. Nat. Mosc. XL, II, 3 (1867) 176; O. and B. Fedtsch. Perech. Rast. Turk. IV, 320 (Consp. Fl. Turk. No. 2779).—*Mulgedium hispidum* Rgl. ex O. and B. Fedtsch. in Tr. Peterb. Bot. Sada XXVIII, 1 (1908) 38 (Pl. Turkest. imprim. Alaicae... II).—*Cicerbita crassicaulis* (Trautv.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 127 (seorsum impressum: Contrib. à l'étude des Compos. III, p. 29, No. 23).—*C. crambifolia* (Bge.). Beauverd f. *hispidula* Beauverd, op. cit. 143 (seorsum impressum: p. 45, No. 50).—*C. chaffanjonii* Beauverd, op. cit. 143 (seorsum impressum: p. 45, No. 51).—*Streptorhamphus chaffanjonii* (Beauverd) O. and B. Fedtsch. 328 in Perech. Rast. Turk. IV (1911) 319 (Consp. Fl. Turk. No. 2778).—*Lactuca chaffanjonii* (Beauverd) Danguy in Bull. Mus. His. Nat. Paris XX (1914) 39.—*L. hispidula* (Rgl.) B. Fedtsch. Rastit. Turk. (1915) 765.—*L. chaffanjonii* (Beauverd) B. Fedtsch. l. c.

Perennial. Root usually 1–2 cm thick, sometimes branched. Stem (20)40–60 cm high, sulcate, fistular, at base usually with remnants of petioles of previous year's leaves, glabrous or almost so in lower part, weakly appressed-hairy above, branched almost from base or lower third, producing rather numerous floriferous branches in leaf axils. Leaves glaucous, thick or slightly fleshy; lower leaves elliptical or oblong-ovate, undivided or (less often!) pinnatipartite, on rather long petioles expanded at base as narrow sheath, erose and with cartilaginous, more or less unicate, spinules along margin; middle cauline leaves oblong or spatulate, semiamplexicaul, cordate-auriculate at base, often more or less entire; upper leaves strongly reduced, usually lanceolate or linear-lanceolate, aristate, usually glandular-hairy; leaves on peduncles scaly, resembling involucre bracts. Capitula mostly with 20–25 florets, almost cylindrical or narrowly campanulate, with fruits 13–20 mm long and 8–12 mm wide, in lax corymbs at apices of slender peduncles of variable length, some capitula usually undeveloped. Involucre bracts often four-rowed, linear, linear-lanceolate, or narrowly triangular, mostly aristate, very short- and densely tomentose on outer surface, dorsally (mostly along midrib) covered with squamiform glandular hairs (also on peduncles). Corolla yellow, sometimes (especially after drying) lilac-colored. Achenes 6–7 mm long and 2.5–3 mm wide, ellipsoid or acute-ellipsoid, with three, more or less prominent, ribs on each side, dark violet, covered with very short, pointed

hairs in transverse sinuate rows (under high magnification!), more distinct in upper part; rather sharply narrowed at apex into yellowish-green, about 2.5 mm long beak, terminating in funnel-shaped disk bearing pappus; white, long hairs of pappus as long as achene or slightly longer; outer corona of more or less numerous, often golden-yellow, short hairs (under a hand lens!). Flowering May to June. (Plate XIX, Fig. 2).

Stony and gravelly slopes at 300–2300 m.—*Soviet Central Asia*: Dzhungaria-Tarbagatai (Dzhungarian Alatau), Syr-Darya, Pamiro-Alai, Tien Shan. Endemic. Described from Schrenk's collections from Dzhungaria (Sarybulak River).

Note. On the label attached to one of Schrenk's authentic specimens, Fedtschenko, for the first time, noted that *Mulgedium crassicaule* Trautv. and *Streptorhamphus hispidulus* Rgl. are the same species. Thus, instead of accepting the more common epithet of Regel, according to the priority rule we have to select the half-forgotten name given by Trautvetter. It must also be mentioned that the incomplete specimens of Schrenk, which are not very suitable for detailed study, differ nevertheless slightly from typical *S. hispidulus* Rgl., described from the region of the extreme western spurs of the Dzhungarian Alatau (along the Ili River) from collections of P.P. Semenov. In particular, the involucre bracts in Schrenk's specimens are somewhat more convex and pointed and whitish on the dorsal surface below. Similar differences in the involucre bracts found in specimens collected far away from the Dzhungarian Alatau, e.g., toward the west of Lake Issyk-Kul, provide a basis to conclude that it is either an aging phenomenon or an effect of insects or lower fungi. Nevertheless, new complete collections are essential for absolute certainty.

3. *S. persicus* (Boiss.) O. and B. Fedtsch. in Perech. Rast. Turk. IV (1911) 319 (Consp. Fl. Turk. No. 2776); Grossh. Fl. Kavk. IV (1934) 258 and Opred. Rast. Kavk. 517 (sub. *Streptorhampho* (sic!) persico B. Fedtsch.) Takht. and Fed. Fl. Yerevana 339.—*Lactuca persica* Boiss. Diagn. pl. or. ser. 1, VII (1846) 9; id. in Fl. or. III, 806; B. Fedtsch. Rastit. Turk. 765.—*Cicerbita persica* Beauvered in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 142 (seorsum impressum: Contrib. à l'étude des Compos. III, p. 44, No. 49); Kitam. in Res., Kyoto Univ. Exp. Karak. a. Hinduk. 1955, II, 405 (Fl. of Afghanistan, 1960).

Perennial. Root thick, sometimes quite robust, 1–3 cm thick. Stem (30)40–50(60)cm high, often with remnants of petioles of previous year's leaves at base, sparsely puberulent (under a lens!), distinctly sulcate, fistular, usually branched below, thick, often assurgent with short fertile branches arising from leaf axils, covered with glandular hairs. Leaves glaucous, thick; lower leaves oblong-elliptical or lanceolate, often very large (up to 30 cm long, 5–7 and up to 10 cm wide), undivided or (less

- often) pinnatipartite, on rather long petioles, expanded at base as narrow sheath, almost entire or sinuate, with cartilaginous, more or less uncinat spinules; middle cauline leaves few, usually sessile, semiamplexicaul, with auriculate or hastate base, entire or subentire, mostly oblong-elliptical; upper cauline leaves strongly reduced, appressed-hairy, auriculate-cordate at base, with branches of inflorescence or individual peduncles in their axil. Capitula usually with 25–35-florets, almost cylindrical or narrow campanulate, with fruits up to 18–25 mm long, on short, thick peduncles and borne in racemose-paniculate (sometimes candelabriform) inflorescence. Involucral bracts lax, mostly three-rowed, flat; outer bracts appressed hairy and glandular pubescent on dorsal surface, inner ones sometimes with beard of fine hairs on outer surface. Corolla yellow.
- 330 Achenes acute-ellipsoid or ellipsoid, usually with one distinct rib in middle on each side, dark brown or yellowish, 5–7 mm long and 1.5–2.5 mm wide, densely covered with transversely sinuate rows of rather short hairs (noticeable under high magnification!), apex fairly gradually attenuate into dark brown beak usually longer than achene (often almost two times as long), terminating in somewhat funnel-shaped disk bearing pappus; longer hairs of pappus up to 10 mm long; outer corona of more or less numerous, often many-rowed, usually golden or lemon-yellow, short hairs (under a hand lens!). Flowering (April) May to June (July). (plate XIX, Fig. 4.)

Stony and rubbly mountain slopes, on rubbly-clayey, calcareous and stony screes, usually at about 1000 m.—*Caucasus*: Southern Transcaucasia; *Soviet Central Asia*: mountainous Turkmenia (Ashkhabad District). *General distribution*: Iran Region (Iran, Afghanistan, Pakistan). Described from Koch's collections from southern Iran. Type in Geneva; isotype in Leningrad.

Section 2. Tuberosi (Boiss.) Kirp. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXII (1963) 318.—*Lactuca* sect. *Tuberosae* Boiss. Fl. or. III (1875) 804.—Outer corona not always distinct (under a lens!) and consists of almost complete row or only few isolated short hairs of same color as inner ones (white or transparent). A few, relatively large, transparent or white, erect (more or less perpendicular to achene surface), papilliform hairs stand out among hairs covering achene (under a lens!). Projections on the areola of disk usually well developed.

Lectotype: *Steptorhamphus tuberosus* (Jacq.) Grossh.

4. *S. tuberosus* (Jacq.) Grossh. in Fl. Kavk. IV (1934) 258 and Opred. Rast. Kavk. 517 (sub *Streptorhampho* (sic!) *tuberoso* (L.) Grossh.).—*Lactuca tuberosa* Jacq. Hort. bot. Vindob. I (1770) 18, t. 47; Ldb. Fl. Ross. II, 2, 802; Boiss. Fl. or. III, 806, p. p. (quoad pl. Tauricam); Schmalh. Fl. II, 167, p. p. (quoad pl. Tauricam et districtum Novorossijsk);

Fedtsch. and Fl. Fl. Evrop. Ross. 1057; Stank. and Tal. Opred. Vyssh. Rast. (1957) 442.—?*Sonchus tuberosus* Murr. Syst. Veget. ed. 13 (1774) 594; L. fil. Suppl. (1781) 346.—?*Lactuca sonchifolia* Willd. Sp. pl. III, 3 (1803) 1530, p. p. (exclusa saltem planta Cretae).—*Wiestia tuberosa* Sch. Bip. in Herb. and Winkl. Jahrb. Pharm. IV (18941) 154, in nota (vidi tantum seorsum impressum sub titulo "Sceleton systematis articulati Cichoriacearum," p. 4.).

331 Perennial. Root thick, usually about 1 cm, less often up to 3 cm thick, mostly vertical sometimes branched. Stem 40–60(80) cm high, weakly and finely appressed-hairy (under a lens!), often reddish-lilac, slightly sulcate, usually branched in upper half. Leaves semiamplexicaul, densely tomentose (under a lens!); lowermost leaves early-withering (more or less undivided?); cauline leaves runcinate, petiolate or sessile, with irregularly arranged and unequal, cartilaginous spinules along margin; upper leaves strongly reduced (uppermost leaves scaly), with axillary peduncles, undivided, lanceolate, with large auricles at base, acuminate. Capitula mostly with 35–45(50) florets, oblong (younger) to cylindrical and campanulate, with fruits up to 30 mm long, in racemose or, less often (in very well-developed plants), racemose-paniculate inflorescence; peduncles thick, often exceeding capitula, usually arcuate above, with one or a few scaly leaves. Involucral brads three- or four-rowed; outer bracts ovate or triangular-ovate, others oblong-lanceolate or linear, often lilac, with distinct network of veins, more or less tomentose, along dorsal surface (under a hand lens!); innermost (longest) bracts attenuate at apex, usually with dark violet tip and lustrous stramineous inner surface. Corolla light blue-purple or light blue-lilac. Achenes ellipsoid, oblong, or lanceolate, usually with one distinct rib in center, dark violet to almost black, 4–5 mm long and about 2.5 mm wide, covered with transversely sinuate rows of very short hairs (under high magnification!), mixed with rather abundant, relatively long, whitish, papilliform hairs, more or less perpendicular to achene surface; achenes attenuate at apex, terminating in filiform, greenish-yellow beak, about two and one-half to three times as long as achene; long and white inner pappus hairs shorter than beak, outer corona of incomplete row of short white hairs. Flowering May to June(July). (Plate XIX, Fig. 5).

Stony mountain slopes, sometimes in open montane forests.—*European Part*: Crimea; *Caucasus*: Western Transcaucasia (Novorossiisk, Gelendzhik). The report of finding it in Georgia apparently is not correct and relates to the following species (*S. petraeus*); even more doubtful are the reports of it occurring outside the USSR. The typification of the species is unclear. The plant was described by Jacquin on the basis of specimens grown from seeds. The native region is not indicated in the original description. Possibly, the type is in Vienna.

Note. *E. trautvetter* (Tr. Peterb. Bot. Sada, VIII, 2, 1863, *Increm. Fl. Phaenog. Ross.* fasc. II, 520, No. 3243) reports *Lactuca cretica* Desf. from Crimea. This species is very close to *S. tuberosus* but differs from it first of all by the yellow corolla and in fact is not found in Crimea.

5. ***S. petraeus*** (Fisch. and Mey.) Grossh. *Fl. Kavk.* IV (1934) 258 and *Opred. Rast. kavk.* 517.—*Lactuca petraea* Fisch. and Mey. in *DC. Prodr.* VII, 1 (1838) 134; *Ldb. Fl. Ross.* II, 2, 803; Schchian in *Fl. Gruz.* VIII, 683.—**lc.:** Schchian, *op. cit.* 685, Plate 439.

- 332 Perennial. Root thick, about 1 cm (less often 2–3 cm), usually vertical, sometimes branched. Stem (20)40–55(80) cm high, usually finely appressed-hairy (under a hand lens!), slightly sulcate, mostly branched above. Leaves semiamplexicaul, densely tomentose (under a hand lens!); lower leaves on long petioles, expanded below, middle leaves sessile, with auriculate-sagittate base, both runcinate, and with fewer cartilaginous spinules and usually numerous (especially in lower leaves) hairs along margin, also beneath on thick midrib and sometimes along other large veins; upper leaves strongly reduced, undivided, narrow-triangular or lanceolate, acuminate, basally sagittate; uppermost leaves and those on peduncles scaly. Capitula with (25)35–40(50) florets, oblong (younger) to cylindrical and campanulate, well developed, with fruits up to (18)25–30(35) mm long, on somewhat thick peduncles usually longer than capitulum, but sometimes as long or shorter; peduncles sometimes more or less arcuate upward, sometimes arising obliquely, covered with short and dense appressed pubescence. Involucral bracts three- or four-rowed, outer bracts ovate or oblong-ovate, others oblong-lanceolate or linear, often lilac-colored, with more or less distinct network of veins, dorsally densely tomentose-pubescent (under a hand lens!), innermost (longest) with subobtuse, often apex dark violet, lustrous straw-yellow inside. Corolla pale yellow (according to Grossheim), on outer surface grayish-light blue. Achenes ellipsoid, oblong or lanceolate, dark violet to almost black, 5–6 mm long and 2–3 mm wide, densely covered with short, transversely sinuate rows of hairs (under high magnification!), mixed with individual, relatively long, white, papilliform hairs, perpendicular to achene surface; achenes often truncate at base, attenuate at apex without beak, resembling two-toothed apex of fruits of many sedges (e.g. *Carex divulsa*), terminating in thin, light-colored beak, almost as long achene or 1.5 times as long; white, thin, and long inner pappus hairs almost as long as beak, outer corona of incomplete row of short white hairs. Flowering May to June (Plate XIX, Fig. 6.)

Stony and rubbly slopes of middle mountain zone.—On screes and limestones, sometimes in shrub thickets.—*Caucasus:* Eastern and Southern Transcaucasia. *General distribution:* Armenia and Kurdistan (Turkey).

Reports about its distribution outside the USSR need confirmation. Described from Sovich's collections from Somkhetia. Type in Leningrad.

Note. *S. petraeus* is very close to *S. tuberosus*, with which it was often combined, for example by Boissier. Both species have much in common not only in their external morphology but also in the finer details of the receptacle, androecium and gynoecium. Thus, for both species the strong development of the antheropod⁺ is highly characteristic. Nevertheless, certain characters such as the color of the corolla, length of the beak in relation to the achene, presence of well-developed hairs along the leaf margins (which, incidentally, are also found sometimes in *S. tuberosus*) and many other "minor" characters, as well as the geographic range, compel me to consider *S. petraeus* as a separate species.

The specimens from the Nakhichevan ASSR are shorter and differ by having a lilac-colored stem and involucre bracts, and also, as a rule, a shallow cutting of the leaves. Possibly, additional studies will provide evidence to treat them as a special race. In particular, the color of the corolla, its change with age, and the conditions of growth must be taken into consideration. The specimens from Kurdistan differ quite markedly from the type specimen by having numerous membranous hairs, which are slightly dilated below, on the leaf and margin of the leaf. The presence of a single herbarium sheet in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, obliges us to refrain from drawing any final conclusions.

Considerable difficulty was faced in establishing the type of *S. petraeus*. In the description of *Lactuca tuberosa* (Prodr. VII, 1 (1838) 133), DeCandolle cited the following locality: "... in convallibus montium Seidchadschi prov. Aderbeischan Persiae locis lapidosus ... sterilibus (Szw. ex Fisch. and Mey. in litt.). Sovich's specimen, preserved in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, provides an opportunity to visualize what Fischer, Meyer and DeCandolle understood by *L. tuberosa* Jacq. Judging from the dried specimen, as well as all other evidence, another label, in particular, "No. 183, Sonchus—? In lapidosus montium ad Schachbulagh¹ 18 maj 829, Szovits." was affixed by mistake to a duplicate of this same plant. In Meyer's hand are appended the words "Somchetiae"; "*lactuca petraea*." On the same sheet, also evidently by mistake, the detailed original description by Meyer is attached. At the same time, four more sheets are preserved in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, two of which have labels written by Meyer: "In lapidosus montium versus Schachbulagh prov. Aberbeidschan. Szovits."; the other two sheets were labeled by different, still unknown persons, and have the label: "183, in

¹ (sic.), the first letter is Russian.

lapidosis montium ad Schachbulagh, Somechetiae. 18 Mai 1829. Szovits." The plants under No. 183 with green divided leaves fully correspond to the original description of Meyer and should be considered as the type specimens. As regards the very first of these specimens, it cannot be assigned either to *Lactuca tuberosa* or to *L. petraea*.

6. **S. linczevskii** Kirp. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXII (1963) 318.—*Lactuca tuberosa* auct. non Jacq., p. p.; Boiss. Fl. or. III, 806.—? *L. tuberosa* L. f. *brevirostris* Krasch. in Izv. Gl. Bot. Sada XXIX, 1–2 (1930) 160, nom. nudum.—*Steptorhamphus crambifolius* auct. non Bge. p. p.; Kirp. in Fl. Turkm. VII, 342.—**lc.**: Kirp. op. cit. 343, Plate LIV (sub *Steptorhampho crambifolio*).

Perennial, Root about 2 cm thick, sometimes branched. Stem (25)35–50(70) cm high, very finely appressed-hairy (under high magnification), slightly sulcate, branched above. Leaves finely appressed-hairy (under high magnification!), especially beneath, where sometimes occasional short prominent hairs are still noticeable; lower leaves long-petiolate; middle (and upper) leaves sessile, semiamplexicaul, with auriculate or hastate base, both elliptical or oblong-elliptical, undivided, more or less coarsely toothed-spinose, less often pinnatilobate and pinnatipartite to almost runcinate, spinulose along margin of their lobes; uppermost cauline leaves narrow-triangular or triangular-lanceolate, small, those on peduncles scaly. Capitula with (25)30–35(40) florets, cylindrical or oblong campanulate, with fruits up to 30–35 mm long, in racemose or racemose-paniculate inflorescence; peduncles unequal, but often shorter than capitulum, thick (1.5–2 mm directly below capitulum). Involucral bracts somewhat squarrose, usually rectangular, very finely appressed-hairy dorsally (under high magnification!), especially in upper part, subobtuse or obtuse, often with violet spot and beard of very short hairs. Achenes oblong-ellipsoid or lanceolate, flattened, but usually with prominently convex achene, usually with only one distinct midrib and two less distinct lateral ribs, dark violet, 7–8 mm long and 2–2.5 mm wide, covered with very short, transversely sinuate rows of light-colored hairs (under high magnification!), mixed with (especially in upper part) occasional longer papilliform hairs more or less perpendicular to achene surface; achenes attenuate into more or less 1 mm long neck, bearing thin, filiform, yellowish or yellowish-green, 13–15 mm-long beak; longer hairs of pappus up to 12–14 mm long, outer crown of incomplete row or very few short light-colored hairs (under a hand lens!). Flowering May to July. (Plate XIX, Fig. 7.).

Stony mountain slopes and ravines.— *Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Iran. Described from Linczevsky's collections from Turkmenia (Kopetdag, vicinity of Kara-Kal, Ioldere Ravine).

7. **S. czerepanovii** Kirp. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXII (1963) 322.

Perennial. Root 2–4 cm thick, woody. Stem 25–45 cm high, very finely appressed-hairy (under high magnification!), slightly sulcate, branched above. Leaves finely appressed-hairy (under high magnification!),
 335 excepting uppermost, broadly or oblong-lanceolate, lamina 2–4 cm wide, undivided (lowermost—always?), shallow-sinuate along margin and with rather numerous short spinules, usually acute; lower leaves on more or less long, semi-amplexicaul petioles, up to 15 cm long (including petiole); middle cauline leaves mostly sessile, with auriculate-sagittate base; uppermost leaves oblong or narrow-triangular, entire, with sagittate base; uppermost leaves scaly, resembling involucre bracts. Capitula with about 35 florets, oblong or cylindrical, with fruits up to 25 mm long, in racemose or racemose-paniculate inflorescence; peduncles unequal, rather thick (directly below capitulum 0.5–1 mm thick). Involucre bracts somewhat squarrose, usually rectangular, greenish, very finely appressed-hairy dorsally (under high magnification!); inner bracts subobtusate or obtuse, with beard of short hairs at apex. Corolla color unknown. Achenes ellipsoid or lanceolate, with one distinct midrib and two lateral (less distinct) ribs, dark violet, 5–6 mm long and 2–3 mm wide, covered with very short, transversely sinuate rows of hairs (under high magnification!), mixed with large whitish papilliform hairs, borne irregularly, but more or less perpendicular to achene surface; achenes apically attenuate into short neck bearing thin, greenish, about 7 mm-long beak with disk bearing pappus; thin white inner hairs of pappus up to 12 mm long; outer crown like previous species. Flowering June. (Plate XIX, Fig. 1.)

Stony steppe slopes in middle mountain zone.—*Caucasus*: Southern Transcaucasia (Aiotsdzor (former Daralagez) and northern part of Zangezur ranges; possibly, also found in Armenian SSR, in districts adjoining Nakhichevan ASSR). Described from collections of Tzvelev and Czerepanov.

GENUS 1657. *Mycelis* Cass.^{1,2}

Cass. in Dict. sc. nat. XXXIII (1824) 483.—*Lactuca* L. sect. *Mycelis* DC. Prodr. VII, 1 (1838) 139.—*Lactuca* L. sect. *Ixeris* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 526, p. p.—*Lactuca* L. sect. *Quinqueflorae* Boiss. Fl. or. III (1875) 817, p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 372.—*Cicerbita* § 3. *Mycelis* Beauverd in Bull. Soc. Bot. Genève, 2 Sér.

¹ Treatment by M.E. Kirpicznikov.

² Named by A. Cassini without explaining the etymology.

II (1910) 116 (seorsum impressum: Contrib. l'étude des Compos. III, p. 18).—*Lactuca* subgen. *Mycelis* Babcock, Stebbins and Jenkins in Cytologia, Fujii Jubil. vol. (1937) 191, p. p.

336 Capitula homogamous, few-flowered (usually comprising only three to five florets), cylindrical or narrow-campanulate, solitary on slender apices of branches in panicles; involucre one-rowed of a few linear or linear-lanceolate bracts and fewer much shorter bracts adjoining capitular base (considered as second row of involucre by some authors); receptacle usually flat, smooth; corolla yellow; achenes dark violet to almost black, flattened, with prominent longitudinal ribs on both sides, at apex attenuate into a beak terminating in broad disk; disk with very short hairs along margin (under a lens!); inner pappus hairs thin, fragile, slightly serrate, readily falling. Basic chromosome number $x = 9$.

Type of genus: *Mycelis muralis* (L.) Dum.

Herbaceous plants rich in latex. According to published reports, the genus comprises about 30 species growing in Europe, Asia, and Africa.

Note. As a separate genus *Mycelis* Cass. has not by any means been recognized by all investigators. Most taxonomists question the validity of separating *Mycelis* from the genus *Lactuca*. However, it is distinguished from typical *Lactuca* first of all by the small and usually constant number of florets in the capitulum as well as by the disk of the achene, which bears, besides the pappus, short ciliolate or papilliform hairs. It seems to us that the genus *Mycelis*, at least as expressed in its typical representative—*M. muralis*, is quite distant from the genus *Lactuca* and, phylogenetically is more allied with species of *Cephalorrhynchus*, from which it is distinguished mainly by the indistinct outer pappus, few-flowered capitula, and phyllaries clearly in only one series. A similar outer pappus and at most only a two-rowed involucre are also found in species of *Cephalorrhynchus*. Ecologically, too, *M. muralis* is closer to *Cephalorrhynchus* than to *Lactuca* subgen. *Lactuca*.

1. ***M. muralis* (L.) Dum.** Fl. Belg. (1827) 60; Mikhailovskaja in Fl. BSSR, V, 194.—*Prenanthes muralis* L. Sp. Pl. (1753) 797; M.B. Fl. taur.-cauc. II, 246, 465.—*Chondrilla muralis* Lam. Fl. Fr. II (1778) 105.—*Prenanthes parviflora* Gilib. Fl. Lithuan. III (1781) 233; Ej. Exerc. phytol. I (1792) 187.—*Lactuca muralis* Gaertn. De fruct. II (1791), t. CLVIII.—*Prenanthes erysimifolia* Willd. Sp. pl. III, (1803) 1543; M.B. Fl. taur.-cauc. II, 245 and III, 529.—*Cicerbita muralis* Wallr. Sched. critic. I (1822) 436; Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II, 139 (seorsum impressum: Contrib. a l'étude des Compos. III. p. 41, No. 44).—*Mycelis angulosa* Cass. in Dict. sc. nat. XXXIII (1824) 483; C.A. Mey. Verzeichn. Pfl. Cauc. 57.—*M. muralis* Rchb. Fl. Germ. excurs. II (1831) 272; Hayek in Hegi, Ill. Fl. Aufl. VI, 2, 1111; Grossh. Fl. Kavk. IV (1934) 255 and

- Opred. Rast. Kavt. 515; Klok. in Vizn. Rosl. URSR, 604; Schchian in Fl. Gruzii VIII, 677; Stank. and Tal. Opred. Vyssh. Rast. (1957) 444; 337 Askerova in Fl. Azerb. VIII, 550.—*Lactuca muralis* Fresen. Taschenb. II (1833) 484; Boiss. Fl. or. III, 817; Popov, Ocherk Rast. i Fl. Karpat, 256; Kirp. in Majevski, Fl. (1954) 632.—*L. muralis* G. Mey. Chlor, Hannov. (1836) 431; Fedtsch. and Fler. Fl. Evrop. Ross. 1058; Syreistsch. III. Fl. Mosk. Gub. III, 331.—*Phoenixopus muralis* W.D. Koch, Synops. Fl. Germ. et Helv. (1837) 430.—*Lactuca muralis* DC. Prodr. VII, 1 (1838) 139; Ldb. Fl. Ross. II, 2, 307.—*L. erysimifolia* DC. op. cit. 140.—*L. muralis* Less ex Schmalh. Fl. II (1897) 169.—**Ис.:** Rchb. f. Ic. fl. Germ. et Helvet. XIX (1859) t. 66 (MCCCCXVII); Syreistsch. op. cit. 331; Javorka and Csapody, Iconogr. fl. Hungar. (1933) t. 559, fig. 4016 (sub *Cicerbita murali*); Hegi, op. cit. 1112 (photo, habitus), p. 1124 (pl. juven.), t. 227, fig. 4 (color.); Mikhailovskaja, op. cit. 195, Plate LXVI (ic. mala).—**Exs.:** GRF No. 973 (sub *Lactuca murali* (L.) Less.); Pl. Polon. exs. No. 378 (sub *Mycelide murali* (L.) Rchb.); Fl. Bulg. exs. (sine numero, sub *Lactuca murali* L.); Petrak, Flora Bohem. et Morav. exs. No. 1090 (sub *L. muralis* DC.); Pl. Herceg. exs. No. 198 (sub *L. murali* L.); Sam. Pl. Suec. exs. ed. Hult. No. 1608 (sub *L. murali* (L.) Fres.).

Perennial (?). Rhizomes not thick, often reduced, with slender, light-colored filiform roots. Stem mostly solitary, (15)30–100(150) cm high, almost wholly glabrous, smooth or, less often, somewhat sulcate, paniculately branched in upper part. Leaves thin, almost papery, light green above, darker or glaucous-green beneath, sometimes violet, with short and soft spinules along margin; lower leaves less often rosulate, on long-winged petioles, lyrate pinnatisect or divided, with hastate, triangular, rhombic or irregular lobes, of which terminal lobe larger, hastate, itself sometimes trilobate; middle and upper cauline leaves gradually reduced upward, sessile, more or less amplexicaul, with sagittate base, not deeply divided or almost entire. Capitula narrow-cylindrical or narrow-campanulate, about 10 mm long and 1.5–3(5) mm wide, solitary at apices of slender terminal branches of stem forming lax panicles, sometimes half as long as plant itself. Involucre with one distinctly developed row of linear or linear-lanceolate bracts; involucre bracts few (mostly five), subobtusate, usually with membranous border, sometimes reddish or violet; usually one to three smaller, more or less erect bracts below; involucre often deflexed after fruiting. Florets in capitulum five (less often four or any other number). Achenes 3–3.5 mm long (excluding beak) and up to 0.8 mm wide, dark violet or almost black, flattened, lanceolate or narrowly obovoid, with more or less numerous prominent longitudinal ribs, attenuate above into neck, terminating in greenish-yellow, short, up to 1 mm long beak with broad disk bearing pappus; disk densely covered with very fine white hairs (under high magnification!);

- 338 achenes covered with numerous pointed, transparent, upward-directed (under a lens!); inner pappus hairs fragile, very thin, somewhat barbed, readily detached, white; outer hairs of pappus short (under high magnification!), not always distinct. $2n = 18$. Flowering June to August (September). (Plate XX, Fig. 9.)

Shady and moist coniferous, deciduous and mixed forests, forested ravines, on humus-rich nonacidic soils; on wet rocks and old delapidated stone walls; in mountains up to upper limit of forests; in the Caucasus mostly in upper forest and subalpine zones at 1,300–2,300 m. *European Part*: Baltic region, Ladoga-Ilmen, Upper Volga, Volga-Kama (south), Upper Dnieper, Middle Dnieper, Volga-Don, Upper Dniester, Bessarabia, Crimea, Lower Don; *Caucasus*: all regions. *General distribution*: Scandinavia, central Europe, Atlantic Europe, Mediterranean, Balkans-Asia Minor, North America (introduced). Described from Europe. Type in London.

Note. Some authors consider *Prenanthes vulgaris* Gueldenst. as a synonym of *M. muralis*. According to the citations of Ledebour and "Index Kewensis," this name was published by Gueldenstedt in his "Reisen durch Russland und in Caucasischen Gebirge" (Vol. I (1787) 113). After carefully examining this paper, I did not find there any other name besides *P. muralis*.

The question of the duration of *M. muralis* is not clear and needs confirmation. Many authors, despite the presence of a rhizome, consider it an annual.

Economic Importance. There are reports that the leaves of *M. muralis* are suitable for making salads.

GENUS 1658. *Cephalorrhynchus* Boiss.^{1,2}

Boiss. Diagn. pl. or. ser.1, IV (1844) 28.—*Lactuca* sect. 4. *Cicerbita* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 526, p. min. p.—*Cicerbita* § 4. *Cephalorrhynchus* Beauverd in Bull. Soc. Bot. Genève, 2 sér. II (1910) 117 (seorsum impressum: Contrib. à l'étude des Compos. III, p. 19).

Capitula homogamous, 10–15(25)-flowered, small (with fruits up to (7)10–18 mm long), mostly cylindrical or oblong, usually in corymbose or corymbose-paniculate, inflorescence, less often solitary at apices of long slender branches. Involucre (excluding few reduced leaves on peduncle, often very close to it), three-rowed, less often two- or four-rowed, involucre bracts herbaceous, densely covered dorsally with short papillae (under a hand lens!); innermost (and longest) bracts with beard

¹ Treatment by M.E. Kirpicznikov.

² From the Greek words *cephale*—head, and *rhynchos*—beak, nose.

of thin hairs at apex (under a hand lens!). Receptacle smooth, flat. Anthers oblong-linear with appressed sagittate basal appendage. Style and its branches densely covered with upward-directed, light-colored hairs. Achenes usually narrow or linear-fusiform, often slightly curved, with
 339 more or less numerous prominent longitudinal ribs, usually with pointed, upward directed, short hairs (under a hand lens!); besides, very short hairs (under high magnification); in transversely sinuate rows; beak thin, of different color than rest of achene. Pappus of outer row forming corona of short (hardly visible without lens) hairs, firmly attached to disk and inner row of relatively long, usually as long as achene, rather thin, white, fragile, usually very readily detached hairs, appearing smooth (under high magnification, barbed).

Type of genus: *Cephalorrhynchus glandulosus* Boiss.

The genus comprises about 10 species of biennial or perennial herbs with thickened or tuberous underground parts. Plants mainly growing in Transcaucasia and Soviet Central Asia, occasionally in Crimea; outside the USSR, known definitely from Iran, Turkey, Syria, Lebanon, and Afghanistan.

Boissier, who established the genus *Cephalorrhynchus* considered it quite close to the genus *Lactuca*, differing from the latter mainly by having cylindrical or fusiform, not compressed, achenes. Bentham, Hoffmann, and many others included *Cephalorrhynchus* in *Lactuca*, while Bower united it, as a section, with *Cicerbita*. Actually, the genus *Cephalorrhynchus* may be closest to the genus *Scariola*.

1. Upper part of stem and especially peduncle densely covered with glandular hairs 2.
- + Stem in upper part and also peduncles smooth or almost smooth, only sometimes with small number of hairs 4.
2. Stem wholly (sometimes excluding only lowest part) covered with squamiform glandular hairs. Plants found mainly in the Caucasus, sometimes in Crimea 3.
- + Stem glandular-hairy only in upper half, smooth or almost smooth below. Plant endemic to Tien Shan 6. ***S. subplumosus*** S. Kovalevsk.
3. Lower cauline leaves pinnatisect, with large number of almost equal lateral segments. Plant found in the Nakhichevan ASSR 3. ***C. kirpicznikovii*** Grossh.
- + Lower cauline leaves pinnatipartite or pinnatisect to lyrate pinnatisect, with small number of lateral segments and distinctly larger terminal segment. Plant found in the Caucasus and Crimea 1. ***C. tuberosus*** (Stev.) Schchian
- 4(1) Stem leafless or almost so at fruiting; capitula solitary at apices of

- long slender branches (peduncles) 8. **C. polycladus** (Boiss.) Kirp.
- 340 + Plants leafy at fruiting; capitula in paniculate inflorescence. 5.
5. Leaves (except uppermost) undivided, broadly elliptical or oblong-obovate, sessile, glaucous, somewhat fleshy, with prominent veins beneath; beak of achenes up to 1 mm long. Plants endemic to southern Transcaucasia (Daralagez, Nakhichevan ASSR) 7. **C. takhtadzhianii** (Sosn.) Kirp.
- + Leaves of different shape; beak of achenes usually longer 6.
6. Lower leaves long (including petiole often exceeding 20 cm in length), wide (in broadest parts up to 8–15 cm), pinnatisect, with large trilobate terminal segment. Plants endemic to Talysh 2. **C. talyschensis** Kirp.
- + Lower leaves shorter, or weakly divided to undivided 7.
7. Beak half as long as achene, sometimes slightly shorter, bifid in lower part as if apical; pappus of very thin hairs, often persistent on mature achenes 4. **C. soongoricus** (Rgl.) S. Kovalevsk.
- + Beak up to one-third as long as achene, not bifid; pappus of very thin, extremely fragile hairs. Plants endemic to Turkmenia 5. **C. kossinskyi** (Krasch.) Kirp.

Section 1. Cephalorrhynchus.—Stem leafy; capitula in corymbose-paniculate inflorescence; achenes mostly dark violet with thin, usually greenish-yellow beak.

Type of section: type of genus.

1. **C. tuberosus** (Stev.) Schchian in Zam. po Sist. i Geogr. Rast. Tbil. 23 (1963) 99.—*Prenanthes tuberosa* Stev. in Mém. Soc. Nat. Mosc. IV (1813) 99; M.B. Fl. taur.-cauc. III, 529.—*P. hispida* M.B. Fl. taur.-cauc. II (1808) 245, non Pall. 1771 (quae revera planta ex affinitate *Chondrilla* est).—*Cephalorrhynchus hispidus* Boiss. Fl. or. III (1875) 821; Grossh. Fl. Kavk. IV (1934) 259 and Oprod. Rast. Kavk. 517; Schchian in Fl. Gruzii, VIII, 692; Askerova in Fl. Azerb. VIII, 560.—*C. confertus* Conrath and Freyn ex Freyn in Bull. Herb. Boiss. III, 9 (1895) 477; Grossh. Fl. Kavk. IV (1934) 259 and Oprod. Rast. Kavk. 517.—*Cicerbita conferta* Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 140 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 42, No. 46).—*C. hispida* Beauverd, op. cit. p. 141 (seorsum impressum: p. 43, No. 48).—*Steptorhamphus hispidus* Bornm. in Beih. z. bot. Centralbl. LX, Abt. B (1939) 224.—*Lactuca hispida* auct. non DC.: Ldb. Fl. Ross. II, 2, 807; Schmalh. Fl. II, 169; Fedtsch. and Fler, Fl. Evrop. Ross. 1059.
- 341 Biennial or perennial. Root tuberous. Stem (25)50–75(105) cm high, fistular, finely sulcate, branched above, densely covered with squamiform-

glandular hairs. Leaves thin, more or less glaucous beneath; lower leaves 10–15(25)cm long, with petioles (2–3 mm wide) expanded at base and semiamplexicaul, lamina pinnatipartite, pinnatisect or lyrate, with large triangular terminal lobe, coarsely sinuate-toothed, with spinescent teeth (lower leaves often lacking in fertile specimens); leaves gradually reduced toward stem apex, with shorter petioles, expanded at base and auriculate-cordate or sagittate, more or less lacking teeth, acuminate; upper cauline leaves sessile, strongly auriculate-cordate and sagittate base, broadly lanceolate to oblong, oblong-lanceolate and narrow-triangular; uppermost leaves linear or narrowly triangular-linear, scaly at base of peduncles and especially on peduncles. Capitula usually with 12 florets, cylindrical or oblong-elongated, with fruits about 15 mm long, in corymbose-paniculate inflorescence; peduncles rather slender, usually shorter than capitulum, more or less densely covered with squamiform-glandular hairs. Involucral bracts usually two-rowed, narrow-triangular or linear with membranous border, dorsally (under a hand lens!) densely papillose, with slightly carinate projection in middle; inner bracts obtuse, usually with dark violet spot and barbula of very short and thin hairs at apex. Corolla yellow, usually blue after drying. Achenes narrow- or linear-fusiform, with 5–15 longitudinal ribs (more distinct in upper part), dark violet, about 5 mm long and 0.5–1 mm wide, covered with very short, transversely sinuate rows of hairs (under high magnification!); and upward-directed hairs in upper part (under a hand lens!); attenuated upper part of achene terminating in thin, greenish-yellow, 2–3 mm long beak (very rarely dark brown); outer row of pappus (crown) dense, of short hairs, inner one of rather thin, white, fragile, readily detached, 5–6 mm long hairs. Flowering May to July. (Plate XX, Fig. 2.).

Forests and forest edges, in thickets, on shady slopes.—*European Part*: Crimea; *Caucasus*: Eastern, Western and Southern Transcaucasia. *General distribution*: Armenia and Kurdistan, Iran Regim (Iran). Described from Georgia on the basis of collections of H. Steven. Type in Leningrad.

Note: The authors of Index Kewensis and Boissier placed an equals sign between *Cephalorrhynchus hispidus* (M.B.) Boiss. [i.e., *C. tuberosus* (Stev.) Schchian} and *Lactuca microcephala* DC. (*Prodr.* VII, 1, 1838, p. 134), the species described by DeCandolle from Iran from Aucher's collections (Fl. exs. No. 3517). In the opinion of A. Schchian, however, these are different species, and, accordingly, she made the new combination
 342 *Cephalorrhynchus microcephalus* (DC.) Schchian (*Fl. Gruzii* VIII (1952) 693). She also pointed out the identity of *C. confertus* with the earlier described *C. hispidus* (i.e., *C. tuberosus*).

C. tuberosus is a markedly variable species in the growth vigor of the overall inflorescence (corymbose panicles), number of longitudinal ribs on the achene, and also the degree of pubescence on the stem and peduncles.

2. *C. talyschensis* Kirp. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXII (1963) 311.—*Lactuca deltoidea* C.A. Mey. Verzeichn. Pfl. Cauc. (1831) 56, p. p. (solum quod plantas talyschenses attingit); Ldb. Fl. Ross II, 2, 806, p. p.; Boiss. Fl. or. III, 816, p. p.—*Cicerbita deltoidea* auct. mult. fl. Cauc. p. p. (plantae e Talysch): Grossh. Fl. Kavk. IV (1934) 252 and Opred. Rast. Kavk. 514; Schchian in Fl. Gruzii, VIII, 667; Askerova in Fl. Azerb. VIII, 545.

Perennial. Rhizome?. Stem (60)70–80(100) cm high, solitary, fistular, slightly sulcate, smooth or almost so, paniculately branched above. Leaves large, thin, green above, glaucous beneath, mostly covered (especially along veins) with pale, very narrow squamiform hairs; lower leaves pinnatisect, with large, more or less trilobate, apical segment, with opposite or alternate, oblong, ovate-triangular or irregular lateral segments, petiole more or less winged, semiamplexicaul, expanded at base; upper leaves smaller, with weakly cut up laminae, at base often auriculate; uppermost leaves small, oblong-lanceolate to linear, scaly on peduncles. Capitula broadly cylindrical to campanulate, (10)13–15 mm high on peduncles, usually exceeding capitula; inflorescence paniculate, sometimes large (30–40 cm long, 10–15 cm wide in broadest part). Involucre, usually three-rowed; inner involucre bracts oblong-linear, two to three times as long as outer, at tip usually violet, roundish, with barbula of very short and thin, light-colored hairs (under a hand lens!). Florets in capitulum about 15; corolla yellow (?). Achenes 6–6.5 mm long and 1 mm wide, linear-fusiform, with 7–10 prominent ribs on each side, mature achenes dark violet or reddish-brown, covered with short, stiff, upward-directed, light-colored hairs (under a hand lens!), in somewhat sinuate rows; achenes at apex attenuate into yellowish, distinct, 1–1.5 mm long beak; outer row of pappus hairs dirty-white forming crown; inner hairs snow-white, very thin, 6–7 mm long readily detached. Flowering June. (Plate XX, Fig. 3.)

Middle mountain zone, in forests.—*Caucasus*: Talysh. Endemic. Described from Meyer's collections from Talysh. Type and isotype in Leningrad.

Note. Freyn identified the plant collected by Sintenis (Iter orientale 1894, No. 7210; Armenia turcica, Szandschak Gümüşkhane, Tempede, 343 in Saxosis, 19, VII) in Turkey as *Lactuca deltoidea* C.A. Mey. (i.e., my species *Cicerbita talyschensis* Kirp.). Beauverd (op. cit. p. 129) agreed with Freyn's identification. Actually, this plant, which I had the opportunity to study (only one specimen), although it resembles *C. talyschensis*, is distinguished at the same time by the larger achenes, leaves, and also involucre bracts. Apparently, a separate race of the *C. talyschensis* alliance grows in Turkey.

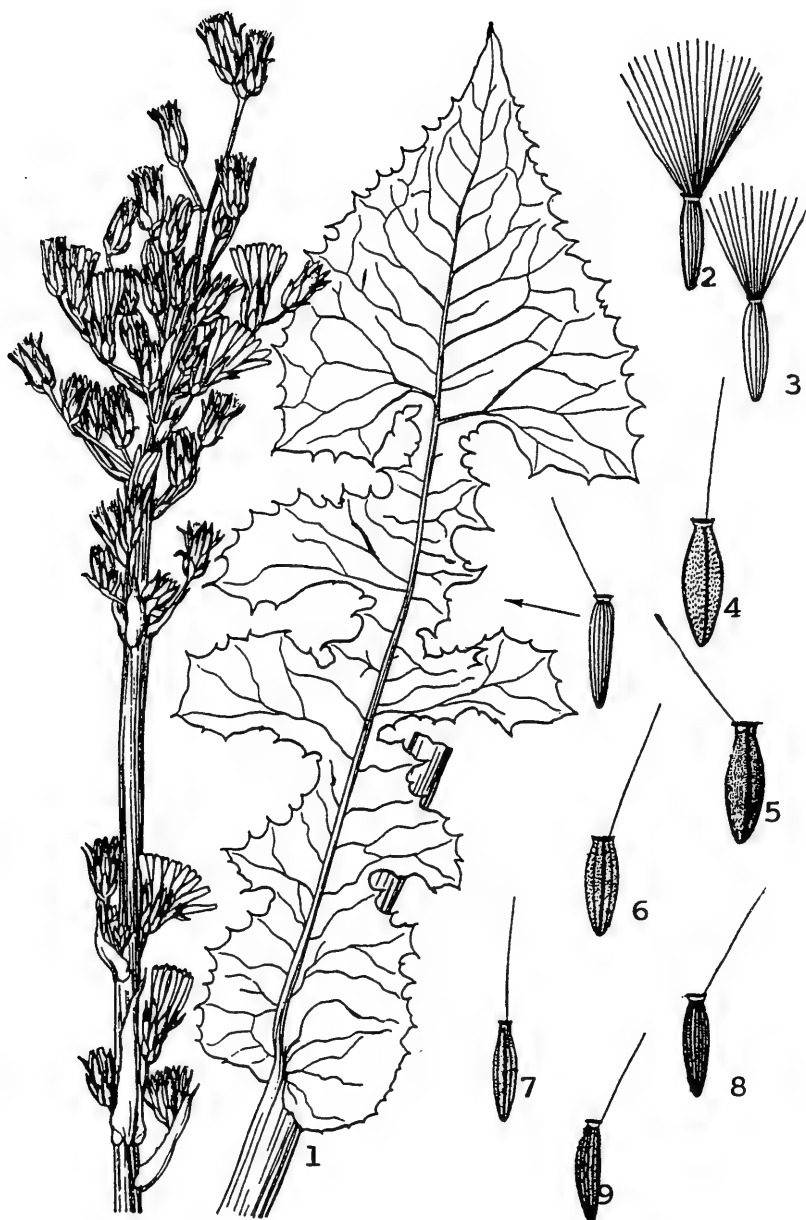
3. *C. kirpicznikovii* Grossh. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk

SSSR XIII (1950) 31; Oprod. Rast. Kavk. 517; Askerova in Fl. Azerb. VIII, 560 ("*C. kirpitschnikovii*").

Biennial or perennial. Root tuberous, mostly globose, 15–20 mm thick. Stem (15)30–55(80) cm high, fistular, often irregularly sulcate, branched above, usually glabrous near base, with increasingly dense pubescence of squamiform-glandular hairs above. Leaves thin; lower leaves up to 25 cm long, long-petiolate, petiole usually longer than lamina, at base expanded, with broadly elliptical or broadly obovate lamina, pinnatisect into oblong or oblong-linear, lateral segments, which are almost equal and similar in shape and more or less horizontal, entire, shallow-toothed, with small number of subobtuse spinules along margin and apex; middle cauline leaves smaller than lower ones, with petiole strongly expanded at base, and auriculate-sagittate, almost amplexicaul, toothed along margin; upper cauline leaves sessile or subsessile, relatively small, with lamina often only with three to five segments (or lobes), antrorse and acute, or lamina more or less entire; uppermost leaves narrowly triangular, strongly reduced, scaly on peduncles. Capitula mostly with 15-florets, cylindrical or oblong, 13–17 mm high, in corymbose or (less often) corymbose-paniculate inflorescence; peduncles slender like inflorescence branches, rather densely covered with squamiform glandular hairs. Involucral bracts usually two-rowed, with membranous border, dorsally densely covered with short papillae (under high magnification), usually with carinate projection in middle (as if along midrib), with few squamiform-glandular hairs, inner bracts usually with violet spot and beard of very thin and short light-colored hairs (under a lens!). Corolla pale yellow. Achenes narrow- or linear-fusiform, usually with numerous (about 15) longitudinal ribs, brown-dark brown to dark violet and blackish, about 6 mm long and up to 0.5 mm wide, covered with short hairs in transverse sinuate rows (under a hand lens!); achenes gradually attenuate at apex bearing light-colored, yellowish, about 3 mm-long beak; pappus almost indistinguishable from former species, but with 6–7 mm long hairs of inner row, not so easily detached. Flowering May to June. (Plate XX, Fig. 1.).

- 344 On stony slopes, in shade of rocks, Shrub thickets and sometimes in open montane forests at 900–2600 m.—*Caucasus*: Southern Transcaucasia (Nakhichevan ASSR). *General distribution*: Probably growing in northern Iran. Described from Nakhichevan ASSR. Type and isotype in Leningrad.

Note. We have tentatively referred two incomplete specimens from the Armenian SSR to *C. kirpicznikovii*: one of them was collected in the Megri District and does not have fertile parts; the other from the Echmiadzin District, has only immature capitula. Both are distinguished from typical *C. kirpicznikovii* by certain details of the form of the leaf blade, but mainly by the presence of a fairly large number of membranous glandular hairs on the lower surface of the blade (especially on the upper



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Plate XXI.

- 1—*Cicerbita thianschanica* (Rgl. and Schmalh.) Beauverd, habit of plant, achene;
 2—*C. alpina* (L.) Wallr., achene; 3—*C. azurea* (Ldb.) Beauverd, achene;
 4—*C. uralensis* Beauverd, achene; 5—*C. macrophylla* (Willd.) Wallr., achene;
 6—*C. sevanensis* Kirp., achene; 7—*C. racemosa* (Willd.) Beauverd, achene;
 8—*C. prenanthoides* (M.B.) Beauverd, achene; 9—*C. bourgaei* (Boiss.) Beauverd, achene.

cauline leaves), which are more abundant along midrib and the more obvious lateral veins; these hairs are present in much larger number on the involucre bracts of the *Echmiadzin* specimen than is characteristic for *C. kirpicznikovii*. It is quite possible that a special race of the genus *Cephalorrhynchus* of the *C. kirpicznikovii* alliance grows in the Armenian SSR, but this question can be finally resolved only by studying more complete material.

Grossheim compared *C. kirpicznikovii* with *C. hispidus* (M.B.) Boiss. [i.e., *C. tuberosus* (Stev.) Schchian]. In fact, it is better to compare this species with *C. candolleanus* Boiss., to which it actually is very similar. According to Kovalevskaja (compare her labels on the herbarium sheets), *C. kirpicznikovii* should generally be identified with *C. candolleanus*. Such an inference is hardly justified. Beauverd (l. c.) already wrote that the peduncles of *C. candolleanus* are weakly glandular-hairy or entirely eglandular, whereas the peduncles of *C. kirpicznikovii* are characterized by abundant glandular hairs. Moreover, *C. candolleanus*, according to the analysis of Beauverd, is distinguished by the relatively smaller size of the achenes and the inner row of the pappus. However, it must be noted that the material identified as *C. candolleanus* is not uniform. Apparently, Boissier combined at least two quite distinct species under this name. One of them is represented by the specimens of Heldreich from Lycia (In lapidosis sylvaticis montis Solyma, Lycia, Heldreich, Majo 1845); these are shorter plants with almost rhombic lateral segments of the lower leaves, which often have a relatively large triangular apical segment. The specimens from Syria ought to be assigned to another
 346 species; only two poor specimens collected by Boissier (Syria, Antilibanus ad Cedros. E. Boissier, Junio 1846) could be examined from this region. Superficially, they strongly resemble *C. kirpicznikovii*, but they can be distinguished easily at least by the little pubescence of the peduncles and still more weakly pubescent stem. Probably, the name *C. candolleanus* Boiss. should be retained for the Syrian specimens, and the Heldreich's specimens should be considered the type specimens of a separate species.

The specimen of Sintenis and Rigo (*Iter cyprium* 1880, No. 798, 18 VI) is of great interest. In habit, it is very similar to the depauperate specimens of *C. kirpicznikovii* but can be easily distinguished by much weaker pubescence on the peduncles as well as by the light brown color of the achenes with a concolorous beak. Finally, the specimens of Bornmüller (*Iter Syriacum* II (1910) No. 12061) from northern Lebanon, identified by him as *Cicerbita candolleana* (Boiss.) Beauverd, are characterized by long and slender, often smooth peduncles. All this raises doubt about the integrity of *Cephalorrhynchus candolleanus* as a distinct species. However, a definitive conclusion can be drawn only from more extensive material than what is at my disposal now.

4. **C. soongoricus** (Rgl.) S. Kovalevsk. in Fl. Uzb. VI (1962) 491.—*Lactuca soongorica* Rgl. in Bull. Soc. Nat. Mosc. XL, II, 3 (1867) 174; O. and B. Fedtsch. Perech. Rast. Turk. IV, 320 (Consp. Fl. Turk. No. 2782); Popov in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14, 104.—*Cicerbita soongorica* (Rgl.) Krasch in Nevski in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4 (1937) 294 ["*C. soongarica* (Rgl.) H. Krasch."]; Kirp. in Fl. Turkm. VII, 328.—**lc.**: S. Kovalevsk., op. cit. t. XLVIII, Fig. 1.

Perennial. Plants with thick tuberous base. Stem solitary, 50–80 cm high, sulcate, sometimes slightly violet at base, glabrous or almost so, or with more or less large number of squamiform hairs below. Leaves tender, green, oblong-obvate or lanceolate, undivided and more or less strongly sinuate to lyrate and pinnatisect, usually spinose-toothed; lower cauline leaves long-petiolate, middle cauline leaves sessile, amplexicaul, with auriculate or sagittate base; uppermost leaves strongly reduced, scaly in inflorescence. Capitula, usually with 10–15-florets, including fruits 9–12 mm long, cylindrical, sometimes slightly broadened upward, mostly on long and slender peduncles, in compound paniculate inflorescence. Involucral bracts usually three-rowed, narrow, more or less acute, often violet or with violet spot, very finely pubescent on outer side (under a hand lens!), narrowly membranous along margin; innermost bracts often with apical barbula of hyaline hairs. Corolla light blue. Achenes narrow-fusiform, dark brown-red or dark violet to almost black, about 5 mm long and 0.5 wide, usually with five prominent longitudinal ribs on each side, covered with inconspicuous, very short, light colored, upward-directed hairs (under a hand lens!); beak thin, greenish, up to half as long as
 347 achene, sometimes only slightly shorter than achene, slightly bifid below as if mounted on achene; inner pappus hairs often persistent on mature achene, almost as long as achene. Flowering April to June(July). (Plate XX, Fig. 4)

In scrub-forest zone.—pistachio and juniper forests, in more or less open places—on stony and clayey slopes in mountain ravines, on gypsiferous deposits; up to 2,000 m; found in the Kirgiz Alatau (according to Nikitina, 1960) in dense coniferous forests with thick moss cover.—*Soviet Central Asia*: Balkhash (southern part, rather less frequent, Dzhungaria-Tarbagatai (small collections from Dzhungarian Alatau, Chulak Mountains), Pamiro-Alai, Tien Shan. Endemic (?). (Probably found in Afghanistan.) Described from Ludwig's collections ("Kirghisensteppe") and Semenov's from Trans-Ili Alatau. Lectotype and paratype in Leningrad.

Note. The specimen with the following label in Regel's hand, "*Lactuca soongorica* Rgl. teste Rgl. leg. Semenow am Flusse Assy in Alatau transiliensis 5000," has been selected as the lectotype.

5. **C. kossinskyi** (Krasch.) Kirp. comb. nova.—*Cicerbita kossinskyi* Krasch. in Izv. Gl. Bot. Sada XXVI, 2 (1927) 115; Kirp. in Fl. Turkm. VII, 328.—*Lactuca kossinskyi* Krasch. l.c. in synonym.—**lc.**: Kirp. op. cit. 331, t. LII.

Perennial. Root thick, fusiform, mostly branched. Stem 30–70(100) cm high, at base 5–10 mm thick, sulcate with sparse, simple, narrow-squamiform or glandular hairs (under a hand lens!), with loose and spongy tissue inside. Leaves somewhat fleshy, with thick midrib and more or less prominent network of lateral veins, erose-toothed along margin and with individual cartilaginous spinules; basal leaves large, 10–20 cm long and 5–7 cm wide, oblonge-elliptical or oblong-obovate, narrowed into broad and long-winged petiole; middle cauline leaves gradually reduced, obovate or lanceolate, usually sessile, semiamplexicaul; uppermost leaves sessile, with auriculate base, usually entire; leaves on peduncles small to scaly, at least on outer side glandular and tomentose. Capitula with 15–25-florets, with fruits 15–18 mm long, oblong or broadly lanceolate, mostly on long peduncles, borne in lax corymbose-paniculate inflorescence. Involucral bracts three- or four-rowed, narrow, with more or less dense, but very short, glandular pubescence on outer surface; outer bracts triangular or lanceolate, often with distinct midrib; innermost bracts linear-lanceolate to linear, at apex with beard of hyaline tomentose-entangled hairs. Corolla blue. Achenes dark brown or reddish-brown, about 6 mm long and 0.5 mm wide, fusiform, with prominent longitudinal ribs covered
348 with very short, stiff, upward-directed hairs; achene apex conically narrowed forming a light-colored, mostly yellowish or greenish-yellow beak, about one-third as long as achene; inner hairs of pappus almost as long as achene, readily detached. Flowering May to July. (Plate XX, Fig. 5)

In ravines, among stones, in more or less shady places.—*Soviet Central Asia*:. mountainous Turkmenia. Endemic. Described from Turkmenia.

Note. From time to time specimens are found in which the lower leaves are runcinate—var. *runcinata* (Krasch.) Kirp.

Krascheninnikov did not select a type for the species. The specimen with the following label is, therefore, proposed as the lectotype: Transcaspian Region, Ashkhabad District, Kopetdag Mountains, Firyuza. V. Lipsky, 3.V.1912, No. 1516 (V.I. Lipsky, *Ekspeditsiya v Zakaspiiskuyu Oblast'* 1912). [Expedition to the Transcaspian Region, 1912]. Lectotype and other type materials preserved in Leningrad.

6. **C. subplumosus** S. Kovalevsk. in Bot. Mat. Gerb. Inst. Bot. Acad. Nauk Uzb. SSR XV (1959) 53; eadem in Fl. Uzb. VI, 491.

Perennial. Roots tuberous. Stem 5–10 cm high, fistular, finely sulcate, branched above, finely appressed-hairy below (under high magnification!)

or almost glabrous, mixed with more or less numerous, squamiform, glandular hairs above. Leaves thin; basal and lower cauline leaves, early-withering; middle cauline leaves on broad, winged, basally auriculate, semiamplexicaul petiole, usually with lyrate pinnatipartite or pinnatisect lamina, with large terminal segment; upper cauline leaves like middle, but usually with one pair of lobes, short-petiolate or sessile; leaves abruptly narrowed at base of fertile branches from broad, auriculate amplexicaul base; leaves on peduncles reduced, resembling involucre bracts. Capitula usually with 10-florets, cylindrical or oblong, with fruits (well developed!) about 10 mm long, in corymbose-paniculate inflorescence; peduncles slender, like inflorescence branches, densely covered with squamiform-glandular hairs. Involucre bracts mostly two-rowed (excluding few leaflets on peduncles, closely adjoining involucre), narrow-triangular or linear, dorsally densely covered with short papillae (under high magnification!); inner bracts longer, usually with carinate projection in middle, mostly with more or less numerous, squamiform, glandular hairs, apically with beard of short, light-colored hairs (under a hand lens!). Corolla white (?). Achenes narrow-fusiform, usually slightly curved, with numerous (about 15) longitudinal ribs, light brown, dark brown or brown-dark brown, 4–5 mm long, covered with transverse sinuate rows of short, fine, upward-directed hairs, more distinct in upper part (under a lens!); apically achenes 349 attenuate into about 1.5 mm long, yellowish-green beak; inner row of pappus hairs fragile, easily detached, barbed (slightly plumose); (under high magnification !), almost as long as achene. Flowering June to July. (Plate XX, Fig. 6.)

Middle mountain zone, near streams, under trees and in juniper forests. —*Soviet Central Asia*: Tien Shah (western part). Endemic. Type and isotype in Tashkent.

Note. The specimen labeled by Pavlov as “*Mulgedium alboligulatum* N. Pavl. sp. n. Bostandyk, Ugamsk Range: Boguchal-sai Ravine, 1,600 m, gravelly slopes. 26.VI.1954. No. 62, Leg. ? V.N. Pavlov” should also be referred to this species.

7. **C. takhtadzhianii** (Sosn.) Kirp. Comb. nova.—*Lactuca takhtadzhianii* Sosn. in Soobshch. Akad. Nauk Gruz. SSR II; 7 (1941) 653; Grossh. Opređ. Rast. Kavk. 516; Askerova in Fl. Azerb. VIII, 553. — **Ic.**: Sosn op. cit. p. 655.

Biennial or perennial. Rhizome lignified, sometimes branched. Stems solitary or two to several, 13(20–40)50 cm high, distinctly sulcate, usually appressed-hairy or flocculose-pubescent below, with more or less considerable mixture of short squamiform hairs (under a hand lens!) branched almost from middle. Leaves, except uppermost, broadly or oblong-obovate, or broadly elliptical, glaucous, somewhat fleshy, unequally

spinose-toothed, with straight or more or less strongly bent teeth, with prominent veins beneath, sessile, semiamplexicaul and auriculate-sagittate at base; leaves near base of large inflorescence branches reduced, more or less ovate or lanceolate, on peduncles scaly. Capitula with about 15-florets, cylindrical or turbinate-cylindrical, about 10 mm high, in corymbose-paniculate inflorescence; peduncles slender, usually sparsely sericeous. Involucre three- or four-rowed; involucre bracts, at least partly, reddish, dorsally covered with dense, short, papilliform hairs (under a hand lens!); inner bracts with membranous border, reddish at apex, subobtusate or obtuse, with beard of fine, silky, slightly entangled white hairs. Corolla dirty blue. Achene about 4.5 mm long and up to 1 mm wide, narrowly elliptical or narrowly oblong-obovoid, dark reddish-brown, more or less flattened, usually slightly curved, mostly with five prominent longitudinal ribs on each side, with transversely sinuate rows of numerous, very short, light-colored hairs (under a hand lens!); apically achenes slightly attenuate, terminating in small, slightly roundish notch, bearing distinct, thin, but short (0.5–1 mm long), greenish beak; inner pappus hairs fine, white, silky, about 4 mm long, more or less firmly attached to disk. Flowering June to August. (Plate XX, Fig. 7.)

350 Dry, clayey, rubbly and stony slopes in the middle mountain zone.—*Caucasus*: Southern Transcaucasia (Daralgyoz, Nakhichevan ASSR). Endemic. Described by Sosnowsky from Takhtadjan's collections. Type in Yerevan.

Note. Apparently, a quite rare plant. There is good material in the Herbarium of the Botanical Institute, Academy of Science of the USSR, which was identified by An.A Fedorov (collections of 1955, in the Shakhbuz District of the Nakhichevan ASSR). We have prepared the description from this material, which, without doubt, belongs to *C. takhtadzhianii*. It does not fully correspond to the original description, which, in all probability, is due to the fact that D.I. Sosnowsky had at his disposal poor or immature specimens.

The underground parts, more or less rounded or slightly fleshy leaves, very short achene beak, and corolla color are all characters that clearly differentiate *C. takhtadzhianii* from the other species of *Cephalorrhynchus*. In habit, this plant more or less resembles *Lactuca rosularis*. Specimens with carefully unearthed underground parts and an ample number of mature achenes are extremely essential for confirming the taxonomic status of this species.

Section 2. Zollikoferiastrum Kirp. sect. nova in Addenda XXVIII, 725. —Stems branched from base, more or less leafless at fruiting; capitula solitary at apices of long, slender branches (peduncles); achenes light colored, terminating in short dark beak.

Type of section: *Cephalorrhynchus polycladus* (Boiss.) Kirp.

8. **C. polycladus** (Boiss.) Kirp. comb. nova.—*Zollikoferia polyclada* Boiss. Fl. or. III (1875) 827.—*Launaya polyclada* Kuntze, Rev. Gen. I (1891) 351.—*Launaea polyclada* Burk. Fl. Pl. Baluch. (1909) 44 (non vidi).—*Cicerbita lipskyi* Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 3 (1936) 353.—*Lactuca lipskyi* Krasch. l.c. nom. in synonym.—*L. intricatissimi* Rech. f. in Dan. Biol. Skr. 8, 2 (1955) 207 (Symbolae Afghanicae II); Kitam. in Res. Kyoto Univ. Exp. Karak. a Hinduk. 1955, II, 431 (Fl. of Afghanistan, 1960).—*Launaea polyclada* B. Fedtsch. in herb. and ex Kirp. in Fl. Turkm. VII (1960) 326.—**lc.** Rchb. f. op. cit. 207, fig 143 (sub *Lactuca intricatissima*: habitus) and 209, fig. 145 (infra a sinistra—calathidium, flos, achenium).

Perennial. Semishrub, (15)25–45 cm high, branched from base, with numerous glaucous, weakly sulcate or striate branches becoming slender toward apex. Leaves slightly thickened, glaucous, finely appressed-hairy (under a hand lens!), crowded mainly in lower part of stem, almost entirely withering before fruiting; basal leaves 2–6 cm long, lyrate, with relatively large oblong or roundish-ovate terminal segment and somewhat small 351 lateral segments, sinuate-toothed with narrow-winged, long, almost amplexicaul petiole; cauline leaves (often absent!) lyrate or linear, semiamplexicaul, uppermost leaves (on peduncles) scaly, indistinguishable from outer involucre bracts. Capitula with about 10 florets, almost cylindrical or turbinate, with fruits 7–10 mm long, solitary at apices of long slender peduncles. Involucre bracts mostly three-rowed; outer bracts narrowly triangular, ovate; inner bracts longer, linear-lanceolate, with membranous border, obtuse, usually dark violet and with barbula of fine light-colored hairs (under a hand lens!), in remaining part dorsally green, very short appressed-hairy with papilliform hairs (under high magnification!). Corolla lilac-colored(?). Achenes about 5 mm long and 1 mm wide, linear-elliptical, light yellow, slightly flattened, with rather numerous, but not always prominent longitudinal ribs, of which only three or four distinct, covered with short, light-colored hairs (indistinct even under high magnification), apically attenuate, bearing thin slightly distinct, about 1 mm long beak; inner row of pappus hairs firmly attached, 4–5 mm long. Flowering June to July. (Plate XX, Fig. 8.)

At 3,000–3,500 m, along banks of mountain streams and lakes or near edges of glaciers; less often in middle mountain zone in juniper woodlands —*Soviet Central Asia*: mountainous Turkmenia (Chopan-Dag), Pamiro-Alai (Darvaz), mountainous Badakhshan. *General distribution*: Iran Region (Iraq, Afghanistan). Described from Iran. Type in Geneva; isotype (collections of Bunge) in Leningrad.

Note. The species is sharply isolated from the remaining members of

the genus *Cephalorrhynchus* and is being included by us in this genus only on the basis of the formal character of the achene structure. The nature of achene as well as other morphological data rule out the possibility of retaining this species in the genus *Cicerbita*. It also cannot be left in the genus *Lactuca*, as initially proposed by Krascheninnikov, because the presence of an outer series of pappus is not a typical characteristic of *Lactuca* species. Either this unique species should be treated as a separate genus, or it should be put, as a separate section, in *Cephalorrhynchus*, to which it is close on the basis of achene structure, which, for the present, we have done.

GENUS 1659. *Cicerbita* Wallr.^{1,2}

Wallr. Sched. crit. I (1822) 433.—*Cicerbita* Wallr. emend. Beauverd in Bull. Soc. Bot. Genève, 2 sér. II (1910) 115, p. min. p. (seorsum impressum: Contrib. à l'étude des Compos. III, p. 17).—*Agathyrsus* D. Don in Edinb. New Phil. Journ. VI (1829) 310, p. p.—*Mulgedium* sect. *Eumulgedium* DC. Prodr. VII, I (1838) 248, p. p.—*Lactuca* sect. 4 *Cicerbita* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 525, p. p.

352 Capitula homogamous, with 10–25(30) florets or (less often) 5–8 florets, small (fruits reaching 10–15 mm in length), mostly cylindrical, in racemose, racemose-paniculate, or corymbose inflorescence. Involucre usually two- or three-rowed; involucre bracts herbaceous, dorsally finely appressed-hairy or densely covered with short papillae (under a hand lens!), often mixed with glandular hairs; innermost bracts two to four times as long as outermost, with membranous border, sometimes with beard of fine hairs at apex (under a hand lens!). Form of achenes distinctly variable: oblong, not or only slightly flattened, or lanceolate to ellipsoid (narrowly linear- or oblong-ellipsoid), more or less distinctly flattened to almost flat, sometimes flattened-triangular; achenes with very short, sometimes with deep constriction just below apex, or apex narrowed into filiform structure, but in both cases achene terminating in a broad (almost equaling its broadest part), somewhat flat disk bearing pappus, more or less densely covered throughout with very short hairs, less often almost glabrous; pappus of outer row of hairs strongly attached to disk, coronate (under a hand lens!) and inner row consisting of somewhat longer, thin, white or dirty-white hairs, usually falling easily, usually appearing smooth (under high magnification, barbed).

¹ Treatment by M.E. Kirpicznikov.

² Name of the plant found in the work of Pope Marcellinus (4th century AD) and corresponds to the name *Sonchus*.

Lectotype of genus: *Cicerbita alpina* (L.) Wallr.

Perennial, mainly rhizomatous herbs, usually with solitary and erect stems, within the USSR found in mountain regions of the Caucasus and Soviet Central Asia, much less frequently in the Carpathians, as well as in the mountains of the Altai in Siberia. Plants primarily growing in forests, in shrub thickets and subalpine meadows.

The number of species in this genus, as well as its characteristics, are quite uncertain. It is not possible to agree with Beauverd (l.c.), who interpreted the genus *Cicerbita* in an extremely broad sense, including under it *Mulgedium* Cass., *Lactucopsis* Sch. Bip., *Mycelis* Cass., *Cephalorrhynchus* Boiss., and *Steptorhamphus* Bge. In this sense, the genus *Cicerbita* included more than 50 species already in 1910. On the other hand, the well-known specialist on the Cichorieae, Ledyard Stebbins (Critical notes on *Lactuca* and related genera. *Journ. of Botany*, London, LXXV, 1937), proposed leaving only two species, *C. alpina* (L.) Wallr. and *C. pančičii* (Vis.) Beauverd, in the genus *Cicerbita* and including in *Lactuca* the genera *Mulgedium*, *Lactucopsis*, *Mycelis*, *Scariola* and a large part of *Cicerbita* in the sense of Beauverd. It is difficult also to agree fully with this viewpoint. For example, it is unthinkable to countenance *Lactuca sativa* near *Cicerbita zeravschanica*, because they differ in almost all characters, from plant habit to achene structure.

We adopt, tentatively, for the genus *Cicerbita*, fairly broad limits, 353 being convinced, however, that further study will require raising the subgenera of this genus (and maybe even certain sections) to the level of separate genera.

1. Florets in capitulum usually five or six, less often eight; stem in upper part covered with squamiform glandular hairs 2.
- + Florets in capitulum 10 or more, very rarely fewer, but then stem in upper part without squamiform hairs 4.
2. Corolla yellow; basal leaves more or less densely covered with narrow squamiform hairs beneath
..... 11. *C. zeravschanica* M. Pop. ex S. Kovalevsk.
- + Corolla lilac or pink 3.
3. Middle cauline leaves elliptical, often large (10–15 cm long and 7–9 cm wide); capitula usually with five-florets, with pappus hairs not exceeding involucre; inflorescence a lax panicle. Species endemic to eastern Fergana 13. *C. kovalevskiana* Kirp.
- + Middle cauline leaves much smaller, with laminae often more or less incised; capitula with five- or six (eight) florets, with pappus hairs slightly exceeding involucre; inflorescence corymbose-paniculate or almost corymbose. Species primarily growing in the

western part of Tien Shan
 12. *C. rosea* (M. Pop. and Vved.) S. Kovalevsk.

- 4(1) Achenes oblong, not flattened or almost not flattened, dark brown, more or less glabrous or covered with extremely short hairs (under high magnification!) with very short, often deep constriction at apex; outer corona of pappus hairs not always distinct 5.
- + Achenes lanceolate or ellipsoid, more or less flattened to almost completely flat or flattened-triangular, usually dark violet, less often olive-colored, narrowed throat-like at apex 7.
5. Involucral bracts dorsally covered with more or less numerous, squamiform, glandular hairs; stem glandular-hairy above 6.
- + Involucral bracts finely appressed-hairy dorsally (under a lens!); stem glabrous or subglabrous. Relatively robust plant (100–125 cm high), with thick woody underground part, within the USSR growing only in Soviet Central Asia
 2. *C. thianschanica* (Rgl. and Schmalh.) Beauverd.
6. Rhizome up to 10 cm long and 1 cm thick; stem in lower part covered with narrow, squamiform hairs; pappus hairs mostly dirty white, less often white, about two times as long as achene. Species found in the north of the European part of the USSR and in the Carpathians 1. *C. alpine* (L.) Wallr.
- + Rhizome short, 2–5 mm thick at base; stem in lower part glabrous; pappus hairs snow-white, about one and one-half times as long as achene. Species found in Siberia and Soviet Central Asia
 3. *C. azurea* (Ldb.) Beauverd
- 7(4) Corolla yellow; outer pappus hairs particularly distinct; achene apex attenuate into relatively narrow, throat-like structure
 10 *C. deltoide* (M.B.) Beauverd
- + Corolla light blue, lilac, or azure; outer pappus hairs more or less distinct; achene apex attenuate into broad, throat-like structure ..
 8.
8. Plant robust, herbaceous, up to 8–200 (250) cm high; stem 10–15 mm in thick at base; capitula 25–30-flowered, broadly cylindrical; peduncles densely glandular-hairy 9.
- + Plant shorter or stem slender at base, capitula usually with fewer flowers, or peduncles not densely glandular-hairy 10.
9. Inflorescence branches 1.5–2(3) mm wide at base, slightly arcuately curved, lateral branches more or less distinctly exceeding central axis; achenes olive-colored; inner pappus hairs white. Plants growing in the European part of the USSR and in Western Siberia
 4. *C. uralensis* (Rouy) Beauverd
- + Inflorescence branches relatively thick, largest branches 3–5 mm thick, usually arcuately curved upward, lateral branches mostly

distinctly exceeding central axis; achenes dark violet; inner pappus hairs dirty white. Plants growing in the Caucasus

..... 5. **C. macrophylla** (Willd.) Wall.

10(8) Achenes, at least in one plane, with only one middle well developed longitudinal rib

+ Achenes with more or less numerous, almost equally prominent longitudinal ribs

11 Stem in upper part, as also involucre bracts dorsally, covered with squamiform, more or less glandular hairs; inner pappus hairs usually dirty white

+ Stem in upper part glabrous or finely acachnoid-tomentose; involucre bracts dorsally covered with dense, short, papillose hairs (under a hand lens!), eglandular

..... 7. **C. racemosa** (Willd.) Beauverd.

12(10) Outer row of pappus hardly distinguishable; disk densely covered with very thin arachnoid hairs (under a hand lens!); inflorescence often up to 30–50 cm or longer

..... 9. **C. bourgaei** (Boiss.) Beauverd

+ Outer row of pappus distinguishable (under a hand lens!); disk not covered with thin acachnoid hairs; inflorescence usually less robust

..... 8. **C. prenanthoides** (M.B.) Beauverd.

355 *Subgenus* 1. **Cicerbita**.—*Sonchus* sect. I. *Cicerbitae* (Wallr.) W.D. Koch, Synops. fl. Germ. et. Helvet. (1837) 433.—*Mulgedium* (sect.) II. *Cicerbita* C.A. Mey. in Mat. k Blizh. Pozn. Prozyab. Ross. Imp. VI (1849) 26 (Verzeichn. Dr. Kolenati gesammelt. Pflanz.).—Achenes oblong, not flattened or only slightly compressed, dark brown, with more or less numerous longitudinal ribs, some of them slightly more prominent, almost glabrous or covered with extremely short hairs (under high magnification!), slightly narrowed toward base, with very short, sometimes rather deep constriction at apex, terminating in broad disk bearing pappus; outer row of pappus (under a hand lens!) not always distinct, inner comprising usually rather easily falling hairs.

Type of subgenus: type of genus.

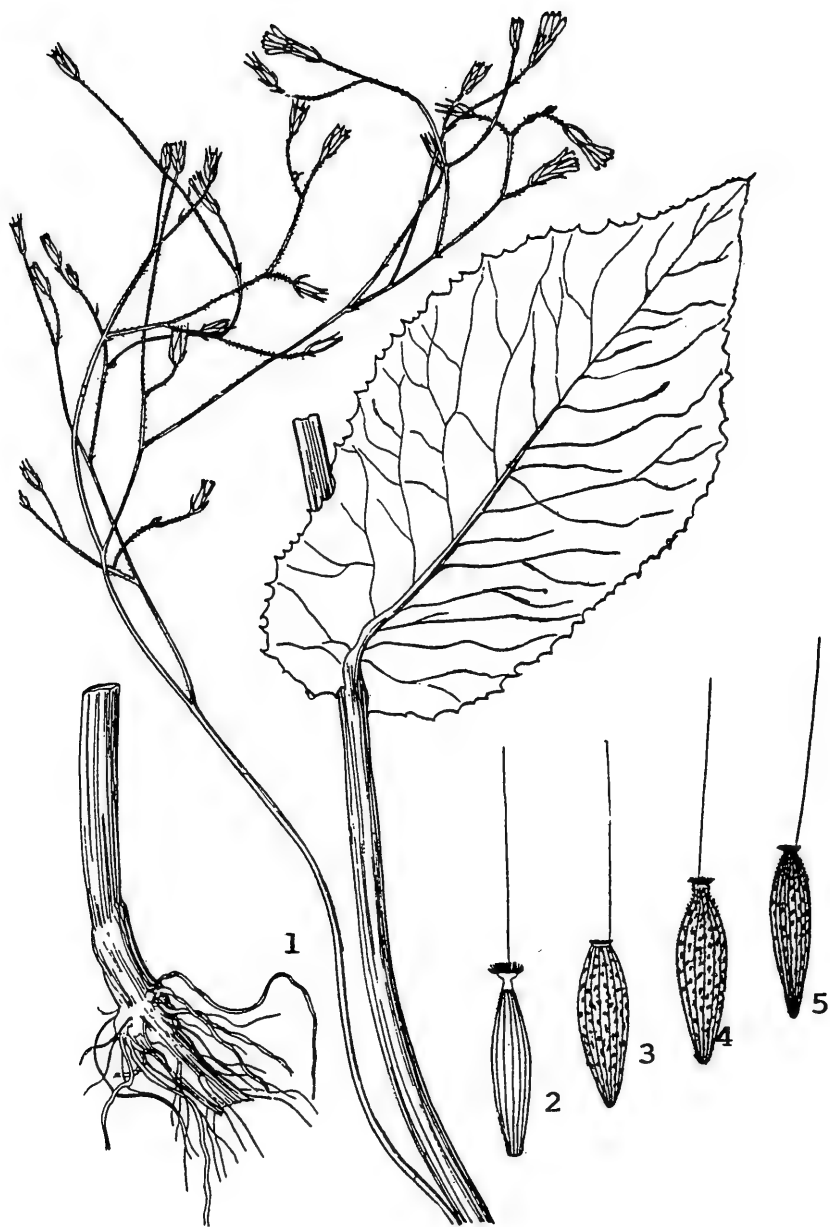
Note. Achenes, if outer whorl of pappus is not considered, are fairly similar to achenes of typical *Prenanthes*.

1. **C. alpina** (L.) Wallr. Sched. crit. I (1822) 434; Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II, 118 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 20, No. 1); Klokov in Vizn. Rosl. URSR 602; Hayek in Hegi, Ill. Fl. 2 Aufl. VI, 2 1099; Stank. and Tal. Opred. Vyssh. Rast. (1957) 442.—*Sonchus alpinus* L. Sp. pl. (1753) 794.—*Hieracium coeruleum* Scop. Fl. carniol. ed. 2, II (1772) 111.—*Sonchus montanus* Lam. Encycl. méth. III (1791–1792) 401.—? *S. coeruleus* Smith, Fl. Brit.

II (1804) 815.—? *Aracium alpinum* Monn. Essai Monogr. Hierac. (1829) 73.—*Mulgedium alpinum* Cass. ex Less. Synops. Compos. (1832) 142; DC. Prodr. VII, 1, 248; Lbd. Fl. Ross. II, 2, 840; Mishkin, Fl. Khibinsk. Gor. 70.—*Lactuca alpine* A. Gray, Synoptic. Fl. N. Americ. I, 2 (1884) 444.—**Ic.**: Rchb. f. Ic. fl. Germ. et Helvet, XIX (1859), t. 64 (MCCCCXV) (sub *Mulgedio alpino*); Javorka and Csapody, Iconogr. fl. Hungar. (1933), t. 559, fig. 4017, Hegi, op. cit. t. 277, fig. 2 (color.).—**Exs.**: Rchb. Fl. Germ. exs. 1820, No. 2427 (sub *Mulgedio alpino* (L.) Wallr.); Billot, Fl. Gall. et Germ. exs. No. 2104 (sub *M. alpino* L.); F. Schultz, Herb. norm. cent. 17, No. 1602 (sub *M. alpino* Less.); Hayek, Fl. Stir. exs. No. 493 (sub *M. alpino* Cass. in Less.); Petrak, Fl. Bohem, et Morav. exs. No. 1096 (sub nomine eodem); Fl. exs. reip. Bohem. Slov. No. 277 (ut supra); Pl. Finl. exs. No. 1410 (sub *Lactuca alpina* (L.) A. Gray); Fl. Bulg. exs. (sine num., sub *Mulgedio alpino* Cass.); Sam. Pl. Suec. exs. ed. Hult. No. 1609 (sub nom. paenultimo).

Perennial. Rhizome up to 10 cm long and about 1 cm thick. Stem 50–100 cm (250 cm) high, sulcate, fistular, in lower part covered with narrow, squamiform hairs, glabrous or almost so above, but densely covered with narrow, squamiform, glandular hairs above; hairs often dark brown red or violet. Leaves thin, green above, glaucous beneath; lower and middle cauline leaves lyrate or lyrate-runcinately divided, with large terminal triangular or triangular-hastate segment, and winged, auriculate, 356 semiamplexicaul petiole, sinuate-toothed, along margin with soft spinules; apical leaves strongly reduced, lanceolate to triangular and narrowly linear, scaly at base and especially on peduncles. Capitula mostly with 15–20-florets obtruncate-conical or almost cylindrical, with fruits 12–15 mm long, in racemose or narrowly racemose-paniculate inflorescence at apices of slender, densely glandular-hairy peduncles. Involucral bracts mostly two-rowed, dorsally covered with squamiform and usually glandular hairs, often violet. Corolla light blue-violet or yellow. Achenes (3)3.5–4(5) mm long and about 1 mm wide, oblong, sometimes slightly compressed, light brown, with numerous strongly projecting longitudinal ribs, finely puberulent (under high magnification!) or almost glabrous, slightly narrowed at base, with rather short and shallow constriction at apex, terminating in broad disk bearing pappus; outer pappus hairs very short, dense, forming corona (under a hand lens!); inner hairs falling rather easily, unequal, but nearly two times as long as achene, dirty white or white (often yellow at base). Flowering June to July (September). (Plate XXI, Fig. 2.)

On Kola Peninsula in spruce and birch forests, depressions, spring marshes, banks of brooks, less often on meadow-covered slopes; in the Carpathians in beech and spruce forests, at relatively high altitudes (reliable reports for the USSR up to 1,200 m, and in the mountains of Europe, up



to 2,200 m).— *Arctic*: Arctic Europe (Rybachii Peninsula, Kildin Island and northern part of Kola Peninsula); *European Part*: Karelia-Lapland (Kola Peninsula), Upper Dniester (Carpathians). *General distribution*: Scandinavia, central and Atlantic Europe, western Mediterranean, Balkans-Asia Minor (northern Balkan Peninsula). Described from Europe (from the high mountains of Lapland, Switzerland and Austria). Type in London.

Note. Ledebour (l. c. 841), apparently for no good reason, included "*Sonchus canadensis* With." as a synonym of this species.

2. *C. thianschanica* (Rgl. and Schmalh.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 123 (seorsum impressum: Contrib. à l'étude des Compos. III, p. 25, No. 12).—*Mulgedium thianschanicum* Rgl. and Schmalh. in Tr. Peterb. Bot. Sada VI, 2 (1880) 329; O. and B. Fedtsch. Perech. Rast. Turk. IV, 350 (Consp. Fl. Turk. No. 2855).

Perennial. Rhizome thick, woody. Stem 100–125 cm high, 10–15 mm thick at base, sulcate, fistular, glabrous or subglabrous. Leaves thin, unequally toothed, teeth softly cuspidate; lower leaves on long, winged 358 petiole, semiamplexicaul, large (often 40–50 cm long and 7–9 cm wide), lyrate pinnatisect, with large terminal, triangular-hastate segment and few small lateral segments; middle cauline leaves sessile, more or less like lower leaves in form; upper leaves smaller, with broad, almost amplexicaul base and more or less undivided, oblong or lanceolate lamina; leaves on peduncles scaly. Capitula usually with 15–20 florets, cylindrical or slightly broadened above, with fruits about 15 mm long and 7–8 mm wide, borne in narrow but long (30–50 cm and longer) racemose inflorescence; often inflorescence branches arising from nodes in clusters (few at a time). Involucral bracts mostly three-rowed, somewhat lax, dorsally finely appressed-hairy (under a hand lens!), at least tip usually violet. Corolla light blue. Achenes about 6 mm long and slightly more than 1 mm wide, oblong, sometimes slightly compressed, brown or dark brown, with more or less numerous longitudinal ribs covered with very short, thin, light colored, upward-directed hairs (under high magnification!) or almost glabrous, apically achenes more or less deeply constricted, terminating in four- or five-angled roundish disk bearing a pappus; outer hairs of pappus very short (about 0.4 mm long), numerous, dense, forming corona; inner hairs fragile, white, easily falling, not strictly equal, 6–7 mm long. Flowering June to September. (Plate XXI, Fig. 1.)

At altitudes from 1,500 to 3,500 m; in spruce forests of *Picea schrenkiana*; among trees, scrubs, in herb meadows and on grassy slopes; floodplains and river banks; near glaciers.—*Soviet Central Asia*: Dzhungaria-Tarbagatai (Dzhungaria), Syr-Darya (one doubtful specimen from Turpak-Bel), Pamiro-Alai, Tien Shan. *General distribution*: Dzhungaria-Kashgaria (Dzhungaria). Described by Regel from the Muzart Valley. Type and isotype in Leningrad.

3. **C. azurea** (Ldb.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 123 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 25, No. 10); Kryl. Fl. Zap. Sib. XI, 3021; Sobolevskaya, Konsp. Fl. Tuvy, 200; Grubov, Konsp. Fl. MNR, 282, No. 1855 (Tr. Mong. Kom. Vyp. 67).—*Sonchus azureus* Ldb. Fl. Alt. IV (1833) 138; Ej. Icon. pl. fl. Ross. V (1834) 27.—*Mulgedium azureum* DC. Prodr. VII, 1 (1838) 248; Ldb. Fl. Ross II, 2, 842; O. and B. Fedtsch. Perech. Rast. Turk. IV, 350 (Konsp. Fl. Turk. No. 2856); Popov, Fl. Sr. Sib. II, 786; Nikitina, Mater. po Fl. Sev. Skl. Khr. Kirg. Ala-too, 110, No. 1125.—*Lactuca azurea* Danguy in Bull. Mus. Nat. Hist. Paris XX (1914) 39; Ling in Contrib. Inst. Bot. Nat. Akad. Peip. III, 4, 185.—**lc.**: Ldb. op. cit. t. 496 (color., bona).—**Exs.**: Kar. and Kir. 1840, No. 895; Smirn. Pl. alt. exs. No. 98.

359 Perennial. Rhizome slender, 2–5 mm thick at base, short. Stem (35)50–70 cm high, slightly sinuate, glabrous below, weakly branched above and more or less densely covered with narrow, squamiform, usually glandular hairs. Leaves thin, well developed, mainly crowded in lower part of stem, green above, gray or glaucous beneath, tomentose, sometimes also with scattered, narrow, squamiform hairs (mainly on veins); lower leaves on narrow-winged, more or less amplexicaul petioles expanded at base, two times or more as long as cordate- or ovate-hastate or reniform lamina; usually lamina more or less lyrate-pinnatisect, and then with one to many small lateral segments; middle cauline leaves smaller than lower, hastate-rhombic or triangular, on shorter and more or less broad-winged petioles; uppermost leaves linear-lanceolate or lanceolate, reduced, in inflorescence scaly. Capitula with 10–12(18) florets, with fruits almost cylindrical, 10–13 mm long, on peduncles densely covered with narrow, squamiform, glandular hairs, forming lax racemose (less often racemose-paniculate or paniculate-corymbose) inflorescence. Involucral bracts mostly two-rowed, usually blackish-violet, with more or less numerous glandular hairs on dorsal surface. Corolla bright azure or dark blue. Achenes about 4 mm long and 1 mm wide, oblong, sometimes slightly compressed, with numerous prominent longitudinal ribs, dark brown, puberulent with light-colored hairs (under high magnification), apically with short, more or less deep constriction, terminating in broad, roundish, four- or five-angled disk, bearing pappus; outer hairs of pappus very short (sometimes indistinct), forming corona, snow-white, easily falling, about 6 mm long. Flowering June to August (September). (Plate XXI, Fig. 3.)

Deciduous and cedar forests, up to their upper limits in subalpine and alpine meadows (Siberia, Mongolia), spruce forests of *Picea schrenkiana* (Soviet Central Asia).—*Western Siberia*: Altai; *Eastern Siberia*: Angara-Sayans; *Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan. *General distribution*: Dzhungaria-Kashgaria, Mongolia. Described from Altai. Type in Leningrad.

Subgenus 2. *Platyachena* Kirp. subgen. nov. in Addenda XXVIII, 726.—Achenes lanceolate or linear-ellipsoid, somewhat compressed to flat or flattered-triangular, usually dark violet, with more or less numerous, less often one to few ribs on each side, entirely puberulent, with hairs in transversely sinuate rows; achenes apically constricted in throat-like structures.

Type of subgenus: *Cicerbita uralensis* (Rouy) Beauverd.

Section 1. *Platyachena* Kirp. sect. nova in Addenda XXVIII, 726.—Achenes more or less compressed or flattened-triangular, at least in one
360 plane with only median distinctly rib, entirely puberulent with hairs in transversely sinuate rows (under a hand lens!).

Type of section: type of subgenus.

4. ***C. uralensis*** (Rouy) Beauverd in Bull. Soc. Bot. Genève, 2 sér. II (1910) 123 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 25, No. 14).—*Mulgedium uralense* Rouy, Illustr. pl. Eur. rar. fasc. 16 (1901) t. 390 (non vidi!).—*Sonchus hispidus* Ldb. Fl. Alt. IV (1833) 140, in adnot.—*Mulgedium hispidum* DC. Prodr. VII, 1 (1838) 250; Ldb. Fl. Ross. II, 2, 844; Kraschen, in Fl. Yugo-Vost. VI, 465; Kirp. in Majevski, Fl. (1954) 629.—*M. macrophyllum* DC. var. *hispidum* Korsh. in Mém. Acad. Sc. Pétersb. VIII, sér. VII, 1 (1898) 265 (Tentam. fl. Ross. or. No. 778).—*Cicerbita gmelinii* Beauverd, op. cit. (seorsum impressum: 1. c. No. 11); Kryl. Fl. Zap. Sib. XI, 3021; Stank. and Tal. Opred. Vyssh. Rast. (1957) 442.—*Mulgedium macrophyllum* auct. non DC. (incl. var. *hispidum* Korsh.); Fedtsch. and Fler. Fl. Evrop. Ross. 1055; Govorukhin, Fl. Urala 521.—**IC.**: J.G. Gmel. Fl. Sibir. II (1749) t. IV fig. 1.

Perennial. Rhizome short, densely covered with tuft of filiform thin dark-brown roots. Stem 80–200 cm high, up to 10–15 mm thick at base, sulcate, fistular, usually glabrous or subglabrous below, more or less densely covered with narrow (almost filiform), squamiform, glandular hairs above, especially from point of branching. Leaves thin, mostly with very narrow, pale, squamiform hairs beneath as well as along margin; lowermost leaves large (including petiole up to 15 cm long), hastate- or cordate-triangular, on long, broadly winged, semiamplexicaul petiole, often divided and then with one to many small, lateral segments; middle cauline leaves lyrate, with large, hastate, apical segment and often also with one pair of small lateral segments; upper leaves smaller, usually sessile, almost amplexicaul, oblong-lanceolate or lanceolate, often unevenly toothed, sometimes sinuate-spatulate, with numerous, very narrow, squamiform, glandular hairs beneath; uppermost leaves reduced; leaves on peduncles hardly distinguishable from involucre bracts. Capitula usually with 25–30 florets, broadly cylindrical, with fruits (10)14–15 (17) mm long, and 6–

10 mm wide, in broad and often long paniculate-corymbose inflorescence; inflorescence branches 1.5–2(3) mm thick at base, more or less arcuately curved, lateral branches more or less distinctly exceeding central axis, all branches covered with narrow, squamiform, glandular hairs, especially dense on peduncles bearing capitula. Involucral bracts mostly three-rowed, dorsally with short, appressed, papilliform hairs (under high magnification!) and more or less dense glandular hairs. Corolla light blue. Achenes about 6 mm long and 1.5 mm wide, lanceolate or linear-ellipsoid, compressed, olive-colored when mature, with one prominent midrib and
 361 often two or three additional, more or less distinct, longitudinal ribs on each side, with throat-like constriction at apex; outer row of pappus hairs very short (under a hand lens!), inner row of easily failing, fragile, white, 7–8 mm long hairs. Flowering June to September. (Plate XXI, Fig. 4.)

Shady moist places; broad-leaved, coniferous, and mixed forests, forest edges, forest glades and logging areas in thickets of tall grass; alder thickets, banks of streams and in forest ravines; subalpine herb meadows to 1,000 m.—*European Part*: Upper Volga, Volga-Kama, Volga-Don (northern part; based on literature records), Trans-Volga Region; *Western Siberia*; ?Ob (extreme west), Upper Tobol (western part). Endemic. Described from Verkhotur (Sverdlovsk Region) at the border of Volga-Kama and Ob regions of the “Flora of the USSR”). Type in Leningrad.

Note. This species is very close to *Cicerbita macrophylla* (Willd.) Wallr. and morphologically quite difficult to distinguish from it. In spite of good geographic isolation, the separation of *C. macrophylla* and *C. uralensis* at the specific level is in need of careful study.

5. ***C. macrophylla*** (Willd.) Wallr. Sched. crit. I (1822) 434; Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II, 124 (seorsum impressum): Contrib. à l'étude des Compos. III, p. 26. No. 16); Grossh. Fl. Kavk. IV (1934) 253 —*Sonchus macrophyllus* Willd. Sp. pl. III; 3 (1803) 1519.—*Mulgedium macrophyllum* DC. Prodr. VII, 1 (1838) 248; Boiss. Fl. or. III (1875) 799 (incl. *β. glabrum* Boiss.).—*M. grande* C. Koch in Linnaea XVII (1843) 279 (incl. *β. glabrum* C. Koch); Lbd. Fl. Ross. II, 2, 841.—*M. glabrum* C. Koch in Linnaea XXIII (1850) 668.—*Lactuca macrophylla* A. Gray, Synoptic. Fl. N. Americ. I, 2 (1884) 444.—*L. macrophylla* Schmalh. Fl. II (1897) 166.—*Mulgedium acuminatum* Conrath and Freyn ex Freyn in Bull. Herb. Boiss. III, 9 (1895) 476 (non *M. acuminatum* DC. Prodr. VII, 1 (1838) 250).—*Cicerbita conrathiana* Beauverd, op. cit. p. 125 (seorsum impressum: p. 27, No. 19). —*C. acuminata* (Conrath and Freyn ex Freyn) Grossh. Fl. Kavk. IV (1934) 253 (nec *C. acuminata* Wallr. Sched. crit. I (1822) 434).—*C. grandis* (C. Koch) Schchian in Zam. po. Sist. i Geogr. Rast. Tbil. 13 (1947) 89 and in Fl. Gruzii VIII, 673; Grossh. Opređ. Rast. Kavk. 515; Askerova in Fl. Azerb. VIII, 546.

Perennial. Rhizome short, densely covered with tuft of slender filiform dark brown roots. Stem (90)150–200(250) cm high, up to 10–15 mm thick at base, sulcate, fistular, mostly hollow, glabrous or almost glabrous below, above, particularly from point of branching, more or less densely covered with thin squamiform, glandular hairs (only very rarely inflorescence branches glabrous or almost glabrous—var. *glabra* (C. Koch) Kirp. comb. nova. h. 1.; basionymum: *Mulgedium glabrum* C. Koch l.c.). Leaves thin, almost always covered with thin, squamiform, often glandular, hairs beneath along main and lateral veins and also along margin; lower leaves large (up to 40 cm long including petiole), ovate- or hastate-triangular, less often broadly rotund-ovate, on long, broadly winged, semiamplexicaul petiole, often also with one or two pairs of small lateral segments; middle cauline leaves rather large (10–20 cm long), broadly lanceolate or oblong-ovate, with broad semiamplexicaul base, and well developed cusp at apex; upper cauline leaves smaller, sessile or subsessile, semiamplexicaul, highly variable (mostly oblong-lanceolate, oblong or linear-lanceolate, less often panduriform or other shapes), usually with numerous, squamiform, glandular hairs beneath; uppermost leaves reduced, on peduncles hardly distinguishable from involucre bracts. Capitula usually with 25 florets, broadly cylindrical or narrow-campanulate, with fruits 12–14(16) mm long, in paniculate-corymbose inflorescence, often large (30–50 cm long, sometimes longer); largest inflorescence branches 3–5 mm thick at base, usually arcuately curved upward, lateral branches usually distinctly exceeding central axis, all covered with scabrous, thin, squamiform, glandular hairs, especially densely on peduncles bearing capitula. Involucre bracts mostly three-rowed, with short, appressed, papillose pubescence on dorsal surface (under high magnification!) and more or less numerous, thin, squamiform, glandular hairs. Corolla light blue. Achenes about 6 mm long and 1.5 mm (sometimes 2 mm) wide, lanceolate or linear-ellipsoid, somewhat flat, dark violet at maturity, with one or two prominent longitudinal ribs on each side, with throat-like constriction at apex; outer row of pappus hairs very short, dense, sometimes yellowish, inner hairs fragile, easily falling, usually dirty-white, 6–7.5 mm long. Flowering June to August. (Plate XXI, Fig. 5)

Montane forests, shrub thickets and subalpine meadows, in more or less shady places.—*Caucasus*: all regions except Talysh. Endemic (?). (Possibly growing in Turkey.) The native region (America) in the original description is in error. Type in Berlin.

Note. Morphologically, this species is quite similar to *C. uralensis*.

6. *C. sevanensis* Kirp. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXII (1963) 304.

363 Perennial. Rhizome rather long (5 cm or more), about 1 cm thick, covered with brown remnants of dead leaves. Stem 70–100 cm high, 5–8 mm thick at base, sulcate, fistular or more or less solid, covered with thin, squamiform, and more or less glandular hairs, usually dense only above, especially from point of branching; glabrous or almost glabrous in middle. Leaves thin, semiamplexicaul, with narrow, squamiform, glandular hairs along veins and margin, or such hairs almost absent; lower leaves rather large (up to 20 cm long including petiole), mostly lyrate, with broadly ovate or hastate-triangular terminal segment and broad-winged petiole, strongly expanded like sheath at base, sometimes also with one pair of small lateral segments, middle cauline leaves usually broadly oblong-ovate or broadly lanceolate, with semiamplexicaul base, and well-developed cusp at apex; upper cauline leaves oblong-ovate, lanceolate or narrowly triangular, mostly very finely appressed tomentose-arachnoid beneath (under a hand lens!) mixed with thin, squamiform, glandular hairs, especially along midrib; uppermost leaves strongly reduced, on peduncles hardly distinguishable from involucre bracts. Capitula mostly with 25 florets, broadly cylindrical or campanulate, with fruits 13–15 mm long, borne in not very large paniculate-corymbose inflorescence (mostly 10–25 cm long); largest branches of inflorescence not exceeding 3 mm in thickness, straight or only slightly arcuate, more or less densely covered with scabrous, thin, squamiform hairs, especially dense on peduncles bearing capitula. Involucre bracts mostly three-rowed, with short appressed hairs on dorsal surface (under high magnification!) and more or less dense, thin, glandular, squamiform hairs. Corolla light blue. Achenes about 5 mm long and 1.5 mm wide, lanceolate or linear-ellipsoid, compressed or flat-triangular, mature achenes dark violet, with one or two (sometimes more) prominent longitudinal ribs on each side, and throat-like constriction at apex; pappus hairs of outer row very short, dense, usually dirty white; inner hairs fragile, easily falling, usually white, almost entirely smooth, up to 7–8 mm long. Flowering July to August. (Plate XXI, Fig. 6).

Montane forests and subalpine meadows.—*Caucasus*: ?Western Transcaucasia, Eastern and Southern Transcaucasia. Endemic. Described from vicinity of Lake Sevan. Type and isotype in Leningrad.

7. *C. racemosa* (Willd.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 122 (seorsum impressum: Contrib. à l'étude des Compos. III, p. 24, no. 8); Grossh. Fl. Kavk. IV (1934) 253 and Oprel. Rast. Kavk. 514; Kolak. Fl. Abkhazii IV, 299; Schchian in Fl. Gruzii VIII, 673; Askerova in Fl. Azerb. VIII, 546.—*Lactuca racemosa* Willd. Sp. pl. III, 3 (1803) 1534.—*Sonchus sibiricus* M.B. Fl. taur.-cauc. II (1808) 240 (non *S. sibiricus* L.).—*Sonchus albanus* Stev. in Mém. Soc. Nat. Mosc. IV (1813)

- 99.—*Lactuca albana* C.A. Mey. Verzeichn. Pfl. Cauc. (1831) 56.—*Mulgedium albanum* DC. Prodr. VII, 1 (1838) 249; Ldb. Fl. Ross. II, 2, 844; Boiss. Fl. or. III, 800.—*M. albanum* DC. var. *glaberrima* Trautv. and var. *setulosa* Trautv. in Tr. Peterb. Bot. Sada, IV, 2 (1876) 386.—*Lactuca albana* Schmalh. Fl. II (1897) 166.—*Mulgedium racemosum* (Willd.) Schischk. in Grossh. and Schischk. Sched. ad herb. "Pl. Orient exsiccatae," fasc. I–VIII (1924) 44.—Exs.: Fl. Cauc. exs. No. 250 (sub 364 *Mulgedio albanum* DC. var. *glaberrimo* Trautv.) Pl. or. exs. No. 175 (sub *M. racemoso* Schischk.); Sintenis, It. or. 1894, No. 6182 (sub *M. albanum* DC.).

Perennial. Rhizome slender, producing long funiform roots. Stem (10)30–60(110) cm high, slightly sulcate, almost glabrous or unevenly and finely arachnoid-tomentose, very rarely covered with thin squamiform hairs at base, branched above or just near tip (sometimes almost from base). Leaves (well developed!) usually few, crowded in lower part of stem; lower leaves more or less lyrate-runcinate or lyrate, basally narrowed into winged petiole; other leaves entire or subentire to incised to various degrees, on winged petiole or sessile, semiamplexicaul, like lower leaves sinuate-toothed or sinuate-spinose, sometimes almost serrate-spinose, more or less cuspidate, glabrous beneath, appressed-hairy or with thin squamiform hairs; upper cauline leaves few, oblong and lanceolate to narrow-triangular and linear, uppermost leaves scaly. Capitula with about 20 florets, almost cylindrical, with fruits 12–14 mm long, usually assembled in few-headed corymbose panicle or panicle; peduncles slender, more or less arachnoid-pubescent or occasionally covered with thin squamiform hairs (var. *setulosa* (Trautv.) Kirp. comb. nova h. 1.; basonymum—*Mulgedium albanum* var. *setulosa* Trautv. l. c.). Involucral bracts mostly three-rowed, with dense, short, papillose hairs on dorsal surface (under high magnification!); inner bracts with barbula of very short, thin hairs at apex (under a hand lens!); corolla light blue or lilac. Achenes about 5 mm long and slightly more than 1 mm wide, lanceolate or narrow-ellipsoid, somewhat flat, mature achenes dark violet, with one to many prominent longitudinal (sometimes winged) ribs, with throat-like constriction at apex; pappus two-rowed, hairs of outer row dense, often yellowish, short (under a hand lens!) forming a corona; hairs of inner row snow-white, 6–7 mm long. Flowering (May) June to August (September). (Plate XXI, Fig. 7.)

More or less shady places in montane forests and subalpine meadows, on stony slopes and screes, in glacial moraines, sometimes in cultivated fields; at altitudes of (800)1,300–3,000 m.—*Caucasus*: Ciscaucasia, Dagestan, Eastern and Western Transcaucasia, Southern Transcaucasia (rarely?). *General distribution*: Balkans-Asia Minor, Armenia and Kurdistan. Described by Willdenow from "Armenia" ("Habitat in Armenia"). Type in Berlin?

Note. An extremely variable species, especially in the nature and degree of pubescence. Both pubescent and glabrous forms often grow together and, apparently, without ecological preference. Trautvetter, in describing his "var. *setulosa*," had in mind only peduncles ("pedicellis magis minusve glanduloso-setosis"). Actually, such or similar pubescence is also found at the base of the stem and quite often on the leaves. Branching varies less, being in the upper part of the stem, in the type specimen examined, but often beginning at the middle of the stem; occasionally the stem branches almost from the base. Sometimes other characters in this species (arrangement of leaves, degree of pubescence of the achenes, etc.) also vary.

Section 2. *Prenanthopsis* Kirp. sect. nova in Addenda XXVIII, 726.—*Mulgedium* sect. II. *Eumulgedium *cyanica* Boiss. Fl. or III (1875) 800, p. p.—Achenes flat-trihedral or strongly compressed to flat, with numerous, more or less similar longitudinal ribs.**

Type of section: *Cicerbita prenanthoides* (M.B.) Beauverd.

8. *C. prenanthoides* (M.B.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 121 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 23 No. 7); Grossh. Fl. Kavk. IV (1934) 252 and Opred. Rast. Kavt. 514; Kolak. Fl. Abkhazii IV, 303; Schchian in Fl. Gruzii, VIII, 668.—*Sonchus prenanthoides* M.B. Fl. taur.-cauc. II (1808) 242.—*Mulgedium prenanthoides* DC. Prodr. VII, 1 (1838) 248; Ldb. Fl. Ross. II, 2, 842; Boiss. Fl. or. III, 800.—*Prenanthes erucaefolia* Willd. ex Ldb. Fl. Ross. II, 2 (1845–1846) 842.—*Lactuca prenanthoides* Schmalh. Fl. II (1897) 167.—*L. prenanthoides* Bornm. in Mitt. Thür. Bot. Ver. n. s. XX (1904–1905) 28 (non *L. prenanthoides* Scop. Fl. carniol. ed. 2, II (1772) 100). —*L. marschallii* Stebbins in Journ. Bot. Lond. LXXV (1937) 16.—? *Mulgedium bourgaei* Boiss. var. *colchicum* Alb. Prodr. fl. Colch. (1895) 152 (Tr. Tifl. Bot. Sada, Prilozh. 1-e, Vyp. 1).—? *Cicerbita bourgaei* var. *β. colchica* (Alb.) Beauverd, op. cit. p. 119.

Perennial. Rhizome? Stem 80–120(200) cm high, shallow-sulcate, solid, rather densely covered with narrow, squamiform hairs, less often more or less arachnoid or almost glabrous. Leaves thin, elliptical (excluding uppermost), oblong-ovate or lanceolate, acute, short-cuspidate, cuneately narrowed at base or with winged petiole, with more or less prominent network of veins beneath, sometimes (especially along midrib) covered with narrow squamiform hairs or more or less glabrous, sinuate-toothed, with relatively long and narrow teeth; lower and middle leaves lyrate-lobate or lyrate, rarely lyrate or almost panduriform, with one or two pairs of lateral lobes and with large terminal, ovate or broadly triangular-ovate, lobe (rarely segment) often truncate at base; leaves on

366 inflorescence axis lanceolate or linear, small, those on peduncles reduced. Capitula mostly with 12–13-florets, almost cylindrical, with fruits 10–11(13) mm long, usually in narrowly racemose or paniculate-racemose inflorescence; peduncles slender, arachnoid-pubescent, with one to many scaly leaves. Involucral bracts three-rowed, dorsally finely appressed-hairy with papillose hairs or mixed with arachnoid hairs; inner bracts subobtusate, often with barbula of very short hairs (under a hand lens!). Corolla light-bluish. Achenes 4–5 mm long and about 1 mm wide, linear-ellipsoid or lanceolate, slightly narrowed toward both ends, somewhat flat or flat-triangular, mature achenes dark violet, with numerous, prominent, more or less similar, longitudinal ribs, more or less densely covered with very short, upward-directed, stiff hairs (under high magnification!). Pappus two-rowed; hairs of outer row barely noticeable (under a hand lens!), dense, forming corona, those of inner row easily falling, thin, white, 5–7 mm long. Flowering (June) July to September. (Plate XXI, Fig. 8.)

Montane forests and shrub thickets at altitudes from 800 to 2,000 (3,000?) m.—*Caucasus*: Ciscaucasia, Eastern and Western Transcaucasia. endemic to the Caucasus, from where Marschall-Bieberstein described it. Type in Leningrad.

Note. *Cicerbita prenanthoides* is close to *C. bourgaei*, with which it is sometimes confused. However, *C. prenanthoides* is distinguished from the latter by the leaf shape, much less developed inflorescence, and nature of pubescence on the disk bearing pappus.

C. prenanthoides is a highly variable species, especially with respect to pubescence.

9. **C. bourgaei** (Boiss.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 118 (seorsum impressum: Contrib. à l'étude des Compos. III, p. 20, No. 2); Grossh. Fl. Kavk. IV (1934) 252.—*Mulgedium bourgaei* Boiss. Fl. or. III (1875) 801.—? *M. bourgaei* Boiss. var. *subintergrifolium* Somm. and Lev. in Tr. Peterb. Bot. Sada XVI (1900) 297.—**Exs:** Balansa, Pl. d'Or. 1866, No. 1467 (sub *Mulgedio bourgaei* Boiss.; isotypus); Sintenis, It. or. 1890, No. 3399 (sub eodem nomine).

Perennial. Rhizome? Stem 80–150(300) cm high, shallow-sulcate, solid, densely covered with narrow, squamiform hairs in lower part, weakly pubescent or almost glabrous above. Leaves thin, but rather stiff, acuminate-elliptical or lanceolate (except uppermost), with distinct network of veins and scattered, narrow, squamiform hairs beneath, glabrous or subglabrous above, toothed or shallow sinuate-toothed, acute or cuspidate; lower leaves lyrate-lobate, usually with one pair of lateral lobes and large terminal lobe, narrowed toward base into broad-winged petiole with cordate-auriculate, semiamplexicaul base; middle cauline leaves sessile or subsessile, with base like lower leaves; upper leaves smaller and

- narrower, often narrowed into petiole; usually linear-lanceolate, to linear in inflorescence, and scaly on inflorescence branches and peduncles.
- 367 Capitula usually with 10-florets, almost cylindrical, with fruits 10–13 mm long, in more or less broadly pyramidal-paniculate, paniculate or (less often) racemose-paniculate inflorescence, often large (30–50 cm long and more); inflorescence branches (usually 5–7 cm long, rarely shorter, but sometimes up to 30 cm long) terminating in slender, appressed arachnoid-pubescent, unequal peduncles. Involucral bracts two- or three-rowed; outer bracts with appressed-arachnoid and papillose pubescence on dorsal surface; inner ones with very short, papillose hairs (under high magnification!), subobtusate and often with beard of very short hairs. Corolla lilac-or azure-colored. Achenes about 5 mm long and slightly more than 1 mm wide, linear-ellipsoid or lanceolate, sometimes slightly asymmetrical, somewhat flat, mature achenes dark violet, with numerous, strongly raised, almost similar, longitudinal ribs, rather densely covered with short, light-colored, upward-directed, stiff hairs (under a hand lens!), more or less distinctly narrowed at apex and bearing disk with pappus; disk densely covered with very fine hairs (under high magnification!). Pappus two-rowed; hairs of outer row very short and dense (under a hand lens!); those of inner row easily falling, thin, almost as long as achene. Flowering July to August. (Plate XXI, Fig. 9).

Ravines and gullies, in shrub thickets, at edges and in logging areas of moist forests, and in tall-grass glades.—*Caucasus*: Ciscaucasia,? Dagestan (one doubtful specimen with the label of Lagovskii), ?Eastern Transcaucasia (western part). Western Transcaucasia (especially Abkhazia), *General distribution*: Balkans-Asia Minor (Turkey, Pontic Range). Described from Turkey. Type in Geneva; one isotype in Leningrad.

Note. A Schchian (Zametka o Kavkazskikh Vidakh roda *Cicerbita* [Note on the Caucasian species of *Cicerbita*]. *Zam. po Sist. Geogr. Rast. Inst. Bot. Akad. Nauk GruzSSR*, No. 13, 1947), believes that A.A. Grossheim carelessly reported *C. bourgaei* Boiss. from the Caucasus. According to Schchian, this species is "alien to our flora," and all the specimens identified by the Caucasian taxonomists as *C. bourgaei* should be referred to *C. prenanthoides*. However, the isotypes of *C. bourgaei*, preserved in the Herbarium of the Botanical Institute, Academy of Sciences of the USSR, allow me to resolve the question definitely in favor of this species occurring in the Caucasus (cf. also note on *C. prenanthoides*).

Section 3. Multicostaria Kirp. sect. nova in Addenda XXVIII, 726.—Achenes flat, often somewhat asymmetrical, with more or less numerous, somewhat similarly developed longitudinal ribs; achenes apically with more narrow, necklike constriction; outer row of pappus particularly well developed; corolla yellow (unlike other species of subgenus).

Type of section: *Cicerbita deltoidea* (M.B.) Beauverd.

- 368 10. **C. deltoidea** (M.B.) Beauverd in Bull. Soc. Bot. Genève, 2 Sér. II (1910) 128 (seorsum impressum: Contrib. a l'étude des Compos. III, p. 30, No. 25) p. p. (solum quod epitheton Biebersteinii id est plantas georgicas attingit); Grossh. Fl. Kavk. IV (1934) 252 and Opred. Rast. Kavk. (1949) 514; Schchian in Fl. Gruzii VIII, 667.—*Prenanthes deltoidea* M.B. Fl. taur.-cauc. III (1819) 539.—*Mycelis ambigua* Cass. in Dict. sc. nat. XLVIII (1827) 426.—*Lactuca deltoidea* C.A. Mey. Verzeichn. Pfl. Cauc. (1831) 56, p. p. (plantis talyschensibus exclusis); Ldb. Fl. Ross. II, 2, 806, p. p.; Boiss. Fl. or. III, 816, p. p.—*Cicerbita olgae* Leskov in Tr. Bot. Muz. XXV (1932) 53; Grossh. op. cit (1934) 252 and (1949) 514; Kolak. in Fl. Abkhazii IV, 303; Schchian, op. cit. 668.—**lc.**: Leskov, op. cit. 54; Schchian, op. cit. 668, Plate 437.

Perennial. Rhizome usually short. Stem (45)70–90 cm high, slightly sulcate, fistular, simple, glabrous or more or less densely covered with very narrow, squamiform, hairs below, weakly paniculately branched above, glabrous or subglabrous. Leaves thin, dark green above, gray or glaucous beneath, all or almost all leaves covered (especially on veins) with narrow, squamiform, hairs; lower leaves large, lyrate pinnatisect, with large hastate or ovate-hastate, irregularly toothed-spinulose terminal segment and smaller lateral segments of different form and size, but mostly oblong or lanceolate, slightly recurved; middle cauline leaves hastate, with broad-winged petiole and large amplexicaul auricles at base; leaves within inflorescence more or less strongly reduced. Capitula with 8–10-florets, cylindrical or slightly expanded above, 10–12 mm long, borne on unequal peduncles in rather narrow and lax paniculate inflorescence. Involucre two- or three-rowed; inner involucre bracts usually violet at tip, with beard of very thin, light-colored hairs. Corolla yellow. Achenes about 4–5 mm long and 1 mm wide, narrow-ellipsoid, often asymmetrical, compressed, with large number (five to nine) of prominent ribs on both sides, mature achenes dark- or reddish-violet, covered with very short, light-colored hairs (under high magnification!), in sinuate rows; apically achenes distinctly attenuate into throat-like constriction terminating in a disk bearing pappus. Pappus two-rowed; outer row well developed, represented by dense corona of short, persistent, light-colored hairs; inner row of snow-white, fine, more or less easily falling, 5–6 mm-long hairs. Flowering June to August. (Plate XXII, Fig. 2).

Middle mountain zone, in fir and beech-fir forests, less frequently in shrub thickets.—*Caucasus*: Ciscaucasia, Eastern Transcaucasia, ?Western Transcaucasia. Endemic. Type in Leningrad. Described from Georgia.

Note. A.I. Leskov, in describing his new species *Cicerbita olgae*,

noted: "Based on the structure of the florets, fruits, and capitula, our *Cicerbita* is almost indistinguishable from *C. deltoidea* (M.B.) Beauverd" 369 (op. cit., p. 55). And, in fact, both these species are so similar that there is no real basis to treat *C. olgae* as a separate species.

Subgenus III. *Policilachena* Kirp. subgen. nov. in Addenda XXVIII, 726.—Achenes narrow or oblong-ellipsoid, ocherous or dark brown with dark violet spots, more or less distinctly compressed or not, with rather numerous, almost similarly developed longitudinal ribs and wholly covered with short hairs (under a hand lens!); achenes apically narrowed into short throat-like constriction terminating in broad disk bearing pappus. Pappus two-rowed; outer row sometimes indistinct, inner row of extremely fragile hairs. Capitula few-flowered (florets usually five, less often six and up to eight); corolla yellow or pink. Species growing in the mountains of Soviet Central Asia.

Type of subgenus: *Cicerbita zeravschanica* M. Pop. ex S. Kovalevsk.

11. ***C. zeravschanica*** M. Pop ex S. Kovalevsk. in Fl. Uzb. VI (1962) 490, 517.—*Mulgedium seravschanicum* M. Pop. in Tr. Uzb. Gos. Univ. Nov. Ser. No. 27, Biol. Vyp. 14 (1941) 105 (descr. ross.).—*Cicerbita seravschanica* M. Pop. ex Zak. Fl. i Rastit. Bass. Zeravsh. II (1961) 427, nomen.—**lc.**: M. Pop. op. cit. (1941) fig. 3 (inter pages. 104 and 105).

Perennial. Rhizome thicker than stem base, usually with dense tuft of numerous thin, funiform, roots. Stem 30–80(100) cm high, fistular, slightly sulcate, often (especially at base) reddish, glabrous or subglabrous below, more or less densely covered with short, squamiform, glandular hairs above. Leaves thin, green, sinuate or only slightly sinuate-toothed, teeth spinescent, more or less whitish; lower leaves on long, narrow-winged, semiamplexicaul petioles, their laminas more or less densely covered with short hairs beneath, pinnatisect, terminating in hastate or cordate-ovate terminal segment and often also with two to many pairs of oblong, triangular, or irregular lateral segments reducing downward; leaves and petioles reduced toward stem apex, strongly expanded at base to auriculate-cordate and almost amplexicaul, laminas less divided (more or less entire in upper leaves); uppermost leaves oblong or lanceolate, scaly on peduncles. Capitula mostly with 5-florets, cylindrical, with fruits 7–10 mm long, borne on slender, unequal peduncles, densely covered with short, squamiform, glandular hairs, in corymbose-paniculate or more or less corymbose, inflorescence. Involucral bracts usually two-rowed, green, dorsally densely covered with very short appressed pubescence (under a hand lens!) with more or less considerable mixture of erect glandular hairs. Corolla yellow. Achenes 4–5 mm long and about 1 mm wide, narrow 370 or oblong-ellipsoid, slightly compressed, with rather numerous, prominent,

longitudinal ribs, ochreous or greenish-brown, with dark violet spots, somewhat densely covered throughout with short, light-colored, upward-directed hairs (under a hand lens!), more distinct in upper part; achenes apically attenuate into very short neck. Pappus two-rowed; outer row indistinct, inner one of fine, white, quite easily falling, about 5 mm-long hairs. Flowering June to September. (Plate XXII, Fig. 3.)

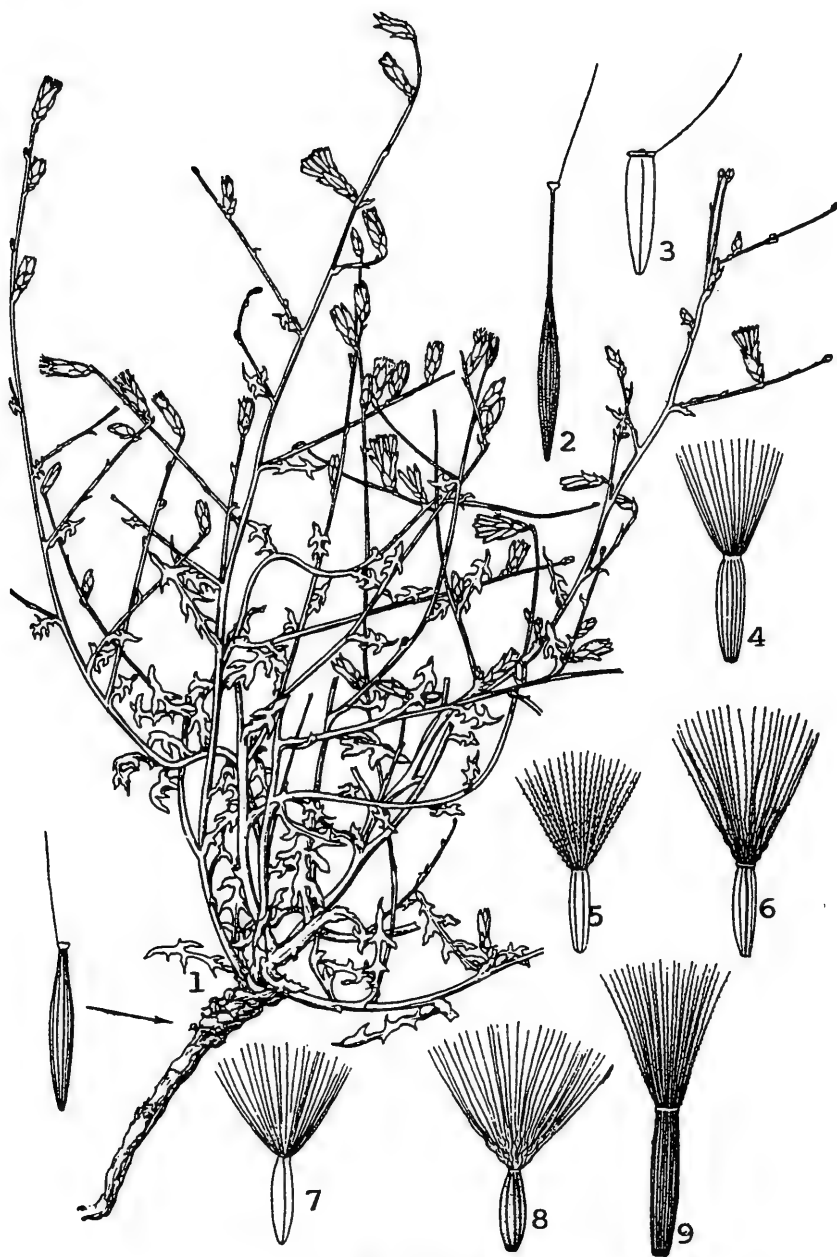
Maple forests with grass-herb cover, juniper woodlands, rose thickets, herb-shrub thickets, slopes with shallow soil in thickets of *Polygonum bucharicum*, stony ravines, and alpine meadows (right up to glaciers?); at 1,900–3,000 m.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Kugitang. Type in Tashkent.

Note. An insufficiently studied and highly variable species. Short, eglandular plants with a weakly developed inflorescence are found together with (especially in Kylyab, Baldzhuan, Shuroabad and some other districts), tall plants (nearly 1 m high), with a strongly developed rhizome, relatively large inflorescence, and dorsally glandular involucre bracts. The material at my disposal does not allow me to attach taxonomic significance to all these differences.

C. zeravschanica is close to *C. rosea*, but differs from it by the pubescence on the leaves beneath, yellow (and not pink) color of the corolla, pappus hairs not exerted beyond the involucre, smaller achenes without (as in *C. rosea*) a distinct throat-like constriction, as well as other characters.

12. *C. rosea* (M. Pop. and Vved.) S. Kovalevsk. in Fl. Uzb. VI (1962) 489.—*Mulgedium roseum* M. Pop and Vved, in Izv. Turkest. Otd. RGO XVII (1924) 29.—**lc.**: M. Pop. and Vved. op. cit. t. V (post page. 34); S. Kovalevsk. op. cit. t. XLIX, Fig. 1.

Perennial. Rhizome rather long, almost as thick as stem base. Stem 60–100 cm high, fistular, slightly sulcate, glabrous or almost glabrous from base to point of branching, densely covered above (especially from point of branching) with short, squamiform, glandular hairs. Leaves green above, more or less glaucous beneath, unevenly sinuate-toothed, with thick subulate tips; lower leaves on long, broad-winged, semiamplexicaul petiole, usually lyrate pinnatisect, with large hastate- or ovate-triangular terminal segment; toward stem apex leaves gradually reduced, petiole disappears, and lamina becomes entire, with cordate-auriculate, and almost amplexicaul base; uppermost leaves on inflorescence branches scaly. Capitula with five or six (eight) florets, cylindrical, with fruits 7–10 mm long, on unequal peduncles, densely covered with short glandular hairs, in corymbose-paniculate or more or less corymbose inflorescence. Involucre bracts mostly two-rowed, greenish, subobtusate and often with beard of thin white hairs, densely covered dorsally with



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Plate XXIII.

- 1—*Scariola orientalis* (Boiss.) Soják, habit of plant and achene; 2—*S. viminea* (L.) F.W. Schmidt, achene; 3—*Prenanthes purpurea* L., achene; 4—*P. abietina* (Boiss.) Kirp., achene; 5—*P. tatarinowii* Maxim., achene; 6—*P. cacaliifolia* (M.B.) Beauverd, achene; 7—*P. pontica* (Boiss.) Leskov, achene; 8—*P. angustifolia* Bousl., achene; 9—*P. maximowiczii* Kirp., achene.

very short, papillose hairs (under high magnification!). Corolla lilac-colored or whitish-pink. Achenes about 6 mm long and 1 mm wide, oblong-ellipsoid or lanceolate, slightly compressed, with many prominent longitudinal ribs, dark brown, covered with rather numerous, short, light colored, upward-directed hairs (under a hand lens!), more distinct in upper throat-like constriction; latter terminating in funnel-shaped disk bearing pappus; pappus hairs of outer row numerous, dense, white (under a hand lens!), inner row of very thin, white, very easily falling, about 5 mm-long hairs. Flowering May to August. (Plate XXII, Fig. 4).

Stony and grassy slopes, in tall-grass cover, among shrubs and in spruce forests; at 1,000–2,400 m.—*Soviet Central Asia*: Pamiro-Alai (Uzgen, Gulcha), ?Syr-Darya, Tien Shan (mainly western part). Endemic. Described from western Tien Shan. Type in Tashkent.

13. *C. kovalevskiana* Kirp. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XXII (1963) 313.

Perennial. Rhizome? Stem 100–110 cm high, fistular, sulcate, often (especially near base) reddish and rather thick (up to 10 mm), at base covered with individual squamiform hairs or glabrous, more or less glabrous above to point of branching, densely covered with squamiform glandular hairs in inflorescence. Leaves thin, green; lower leaves on long, broad-winged, almost amplexicaul petiole, more or less strongly pinnatisect, with large terminal segment; middle cauline leaves sessile, more or less elliptical or oblong-elliptical, with very broad, almost amplexicaul, cordate-auriculate or sagittate base, more or less distinctly sinuate-toothed, with spinescent teeth; leaves in inflorescence reduced. Capitula mostly with 5-florets, cylindrical, with fruits up to 1 cm long, on very slender peduncles much longer than capitula, densely covered
373 with short, squamiform, glandular hairs; common inflorescence very long, usually very sparsely paniculate. Involucral bracts mostly two-rowed, green, dorsally covered with short, appressed, papillose hairs (under high magnification!), and often also with divergent glandular hairs; inner bracts longer, with membranous border. Corolla pink. Achenes about 4 mm long and 1 mm wide, oblong-ellipsoid or lanceolate, distinctly compressed, with numerous prominent longitudinal ribs, light brown, with scattered dark spots, densely covered throughout with short, light-colored upward-directed hairs, more distinct in upper part of achene; achenes apically attenuate into short but distinct, throat-like constriction; outer row of pappus comprising rather numerous, very short, white hairs (under a hand lens!), inner row of less numerous, fine, snow-white, more or less easily falling, about 5 mm long hairs. Flowering July to August. (Plate XXII, Figs. 1, 5).

Deciduous forests and tree-shrub covered slopes. *Soviet Central Asia*:

Tien Shan (eastern Fergana). Endemic. Described from kyzyl-Ungur District. Type in Leningrad.

Note. Originally, this species was designated by the name *C. ferganica* S. Kovalevsk. (cf. Kovalevskaja. *liguliflorae* flory Uzbekistana [Liguliflorae in the Flora of Uzbekistan]. Abstract of Dissertation. Tashkent. 1956, p. 16) but was not described by her subsequently.

Doubtful and Deleted Species

1. ***C. oligocephala*** Zak. in Tr. Uzb. Gos. Univ., Nov. Ser. Vyp. 89, (1958) 166, nomen.

It is reported from "Yailau" [summer pasture] and stony slopes with coarse herb cover. No more information reported. There is no description.

2. ***C. plumieri*** (L.) Kirschleg. Fl. d'Alsace I (1852) 401.—*Mulgedium plumieri* C. Koch in Linnaea XXIII (1850) 668.

Koch writes about this plant: "Aus Grusien von Wilhelms erhalten." Meanwhile, there is no mention of *Mulgedium plumieri* by Boissier, nor by any of the authors of the flora of Caucasus, although Trautvetter included this species in his Incrementa. This is a western European plant, so the name given by Koch apparently is simply the result of an imprecise identification.

GENUS 1660. ***Lagoseriopsis*** Kirp. Gen. Nov. ^{1,2}

Kirp. in Addenda XXVIII, 726

374 Capitula homogamous, few-flowered (with five or six florets), small, narrow-cylindrical or narrow-turbinate-cylindrical, solitary at apices of filiform branches. Involucre mostly two-rowed, comprising few bracts. Achenes variable: outer achenes with easily falling pappus, columnar-prismatic, densely pubescent; inner achenes with persistent pappus, weakly pubescent to glabrous.

Annual plants of deserts with branched, slender, sparsely leafy stems.

A monotypic genus, whose single species was first described in the genus *Launaea*, although it differs sharply from *Launaea* in achene structure. The achenes of our species strongly resemble those of some *Lagoseris* species but the receptacle of *Lagoseris* has long scales and, besides, the pappus has a different structure than in *Lagoseriopsis*. This plant also cannot be referred to the doubtful genus *Heterachaena* (even if it is recognized) in spite of the superficial similarity of *Lagoseriopsis*

¹ Treatment by M.E. Kirpicznikov.

² From the generic name *Lagoseris* and the Greek word *opsis*—external appearance.

Popovii to *Heterachaena massauensis* Fresen. The oblong-ellipsoidal, more or less compressed achenes with a beak-like narrowing at the apex, as well as the structure of the pappus in *Heterachaena*, are not at all similar to the achene and pappus of *Lagoseriopsis*. Boissier (*Fl. or.* III, 1875, p. 825) tried with utmost justification to refer *H. massauensis* to section "*Brachyrhamphus*" of the genus *Zollikoferia*, i.e., genus *Brachyrhamphus* DC.

Type of genus: *Lagoseriopsis popovii* (Krasch.) Kirp.

1. **L. popovii** (Krasch.) Kirp. comb. nova.—*Launaea popovii* Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (1933) 180; Pavlov, Fl. Tsent. Kazakhst. III (1938) 360; Kirp. in Fl. Turkm. VII, 322; Zakirov, Fl. i Rastit. Zeravsh. II, 426.—*Crepis popovii* Krasch. ex Pavl. 1. c. nom. in synon.—*Zollikoferia popovii* Krasch. ex Pavl. 1. c. nom. in synon.—*Heterachaena popovii* S. Kovalevsk. in Fl. Uzb. VI (1962) 478.—**!c.**: Kirp. op. cit. 323, Plate XLIX (sub *Launaea popovii*); S. Kovalevsk. op. cit. t. XLV, fig. 3 (sub *Heterachaena popovii*).

Annual. Stem 10–25 cm high, glabrous or somewhat sparsely tomentose below, weakly sulcate (under a hand lens!), slender (about 1 mm thick in lower thickest part), branched, terminating into filiform branches bearing solitary capitula at apex. Basal leaves in rosula, somewhat thick, 1–2 cm long, broadly obovate, erose-toothed, with cartilaginous thickening at tips of teeth; cauline leaves narrow-linear, 4–6 cm long, upper much smaller; plants usually leafless at fruiting. Capitula narrowly cylindrical or narrowly turbinate-cylindrical, about 5 mm long, with four to six florets. Involucre two(three)-rowed, comprising few, finely pubescent (under a hand lens!) or almost glabrous bracts; outer bracts rotund-rhomboid or broadly ovate, very small, slightly shorter than inner; inner bracts linear, subobtusate, with more or less wide, transparent border, often carinate, more or less divaricately divergent at fruiting. Corolla yellow. Achenes 6–10 mm long, variable: outer achenes with easily falling pappus, columnar-prismatic, slightly attenuate at apex, longitudinally weakly sulcate, with sharp margin, along which uncinatate processes are arranged, densely covered, as also entire achene, with very short, erect, whitish hairs (under a hand lens!); inner achenes more attenuate at apex, longitudinally rather deeply sulcate, relatively weakly pubescent to glabrous, with pappus of persistent, silky-white, almost entirely smooth hairs, one-third to half as long as achene; intermediates (in habit as well as pubescence) between these two main forms are found. Flowering April to June(July). (Plate XX, Fig. 10.)

Rubble slopes, outcrops of gypsiferous rocks, stony deserts (hammada). *Soviet Central Asia*: Aralo-Caspian (eastern part), Kyzyl-Kum, Amu-Darya, Pamiro-Alai (lower reaches of Sary-Su River). Endemic. Described from Sultan-Uizdag Range. Type and isotype in Leningrad.

GENUS 1661. *Youngia* Cass.^{1,2}

Cass. in Ann. Sc. Nat. Paris, ser. 1, XXIII (1831) 88 and Opusc. phyt. III (1834) 86; DC. Prodr. VII, 1 (1838) 192; Ldb. Fl. Ross. II, 2 (1846) 836, p. p.; Bab. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 5 (The Genus *Youngia*); Kitamura in Mém. Coll. Sc. Univ. Kyoto, ser. B, XXII, 1(1955) 116, p. p.—*Crepis* Sect. *Youngia* (Cass.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 514, p. p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. p.

Capitula homogamous, small or medium with fewer (4–16) florets, borne in narrow, racemose, lax corymbose, or paniculate-corymbose inflorescence. Involucre cylindrical or cylindrical-campanulate, 2.5–6 mm wide; involucre bracts broadly ovate and oblong-lanceolate (outer bracts) to oblong-linear (inner bracts); outer bracts (except in *Y. serawschanica*) acute, inner obtuse, on both sides glabrous or covered with eglandular, crisped or setose, but then one-rowed hairs near apex, with well-developed cornicle, rarely tubercle; outer bracts 3–7(10), one- or two-rowed, unequal, one-fifth to two-fifths as long as inner; inner bracts five to eight (nine), two-rowed, all equal with membranous border (outermost), and slightly thickened at base at fruiting. Receptacle finely pitted or smooth, glabrous. All florets ligulate, yellow, sometimes purple on outer side of ligule, one and one-half to two times exceeding involucre, one-rowed, bisexual; corolla 11–20 mm long; ligule five-toothed; corolla tube 1.5–4.5 mm long, puberulent, hairs scabrous or smooth. Anthers with small basal appendage; filaments flattened, glabrous. Style bifid, its branches mostly yellow, divergent. Achenes similar, 3.7–7(9) mm long, fusiform, dorsally compressed, beakless, narrowed into short, fairly thick tip, or in short, more or less thin, beak-like structure with 10–12(14) prominent, obtuse, 376 unequally thick, spinose and short-pillose ribs (smooth in *Y. serawschanica*); hilum straight; pappus usually as long as achene, white, rarely pale rusty, comprising numerous, scabrous, usually soft, equal hairs, easily falling singly or not, sometimes in groups (and then basally connate in ring). Perennial herbs (in the USSR) with erect, leafy (glabrous, as also leaves) stems and pinnatisect, pinnatifid, sinuate-toothed, or entire leaves.

Type of genus: *Y. japonica* (L.) DC.

An East Asian genus comprising about 30 species.

The most reliable feature distinguishing the genus *Youngia* Cass. from the closely related genus *Crepis* is the morphology of the achenes. The

¹ Treatment by S.K. Czerepanov.

² Named in honor of the early 19th century British botanist William Young.

achenes in *Youngia* species are dorsally compressed, with unequally thick ribs, but are cylindrical in the species of *Crepis* (sometimes the outer achenes are compressed from the sides), with equally thick ribs, or rarely oblong-striate. All the indigenous species of *Youngia* are well distinguished from the species of *Crepis* (except for *C. corniculata* Rgl. and Schmalh.) by the well-developed, narrow, curved horns on the involucre bracts near the tip. Section *Ixeridopsis* Babc. of *Crepis* and section *Crepidopsis* Babc. and Stebbins of *Youngia* occupy an intermediate position between these genera on the basis of their characters, indicating their close phylogenetic affinity. The genus *Youngia* displays the most affinity with the genus *Ixeris*, in which the achenes are also dorsally compressed, but with a beak, and their ribs are more or less equally thick, very prominent, and often winged.

1. Stem solitary, simple, branched only in inflorescence, with very short and slender, approximate, equally long lateral branches, bearing one to three (six) capitula; basal and lower cauline leaves linear or oblong-linear, entire, or indistinctly toothed; capitula in narrow but long (usually half as long as stem) racemose-panicles 1. **Y. stenoma** (Turcz.) Ldb.
- + Stems few to numerous, less often solitary, branched from middle or base, with long, thicker, distant lateral branches; basal and lower cauline leaves pinnatisect to sinuate-toothed, less often entire, but then of different form; capitula in lax corymbose or paniculate-corymbose inflorescence 2.
2. Outer involucre bracts broadly ovate or oblong-ovate, obtuse, three to five; corolla tube and achenes glabrous; achenes 7–9 mm long; pappus pale rusty; basal leaves usually sinuate-toothed, pinnatilobate or runcinate-pinnatipartite, on short, winged, glabrous petiole 6. **Y. serawschanica** (B. Fedtsch.) Babc. and Stebbins
- 377 + Outer involucre bracts oblong-lanceolate, acute, 5–10; corolla tube and achenes pubescent; achenes 3.7–7 mm long; pappus white; basal leaves pinnatisect or deeply pinnatipartite, on long, un-winged petioles, tomentose in axils from dirty rusty hairs 3.
3. Stems numerous, slender, 0.5–1.3 mm thick at base, strongly divaricately branched from base; leaf segments narrow-linear; involucre bracts glabrous; corolla 11–11.5 mm long; achenes slightly compressed dorsally, narrowed in short, somewhat thick, apex up to 0.7 mm long and 0.3–0.4 mm wide with weakly developed disk 5. **Y. tenuicaulis** (Bab. and Stebbins) Czer.
- + Stems few or solitary, thicker, 1–4(5) mm thick at base, branched from middle or base, with upward-spreading or divergent lateral

- branches; involucre bracts pubescent, very rarely glabrous; corolla 11–20 mm long; achenes distinctly compressed dorsally 4.
4. Segments of leaves linear-filiform or narrowly linear; involucre 7.5–9.5(10.5) mm long and 2.5–3.5 mm wide; involucre bracts farinose on outer surface; achenes 3.7–5(5.5) mm long, attenuate into short, thicktip, up to 0.5(0.7) mm long and 0.4–0.6 mm wide with weakly developed disk **Y. altaica** (Babc. and Stebbins) Czer.
- + Segments of leaves oblong, lanceolate, linear, less often linear-filiform; involucre 8–14 mm long and 2.5–6 mm wide; involucre bracts covered on outer surface with somewhat long, crisped hairs; achenes 4.5–7 mm long 5.
5. Involucre (9)10–14 mm long and (3.5)4–6 mm wide; corolla 12–20 mm long; achenes dark brown, less often black, attenuate into short, rather thicktip, 0.5–1(1.5) mm long and about 4 mm wide, with weakly developed disk; pappus 6–7 mm long 2. **Y. diversifolia** (Ldb.) Ldb.
- + Involucre 8–10.5(11) mm long and 2.5–3.5(4) mm wide; corolla 11–15 mm long; achenes black, apically attenuate into short, more or less thin, beak-like structure 0.7–1.5(2) mm long and 0.2–0.3 mm wide, abruptly expanded at apex into a broad disk; pappus 4–6 mm long 3. **Y. tenuifolia** (Willd.) Babc. and Stebbins.

Section 1. *Stenophytum* Babc. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 25 (The Genus *Youngia*.—*Crepis* sect. *Eucrepis* DC. Prodr. VII, 1 (1838) 161, p. min. p.; Popov, Fl. Sr. Sib. II (1959) 780, p. min. p.—Plants perennial, entirely glabrous; taproot more or less thickened, with simple, short, up to 1 cm thick caudex. Stem solitary, simple, branched only in inflorescence, with strongly reduced, approximate, slender, upward-directed, lateral branches of different length, bearing one to three (six) capitula. Basal and lower cauline leaves linear or oblong-linear, entire, indistinctly toothed or (in many Mongolian plants) sinuate-toothed, long petiolate; middle and upper cauline leaves linear or narrowly linear, entire, upper leaves sessile, strongly reduced in inflorescence, bract-like. Capitula small, with 8–12 florets in very narrow, but long (usually half as long as stem) racemose-panicles. Outer involucre bracts one-fifth to one-third as long as inner, ovate, or oblong-lanceolate, acute. Receptacle pitted, glabrous. Corolla 11–12 mm long, with 3–4 mm long glabrous tube. Achenes dark brown, 4–5.5 mm long and 0.8–1 mm wide, fusiform, slightly compressed dorsally, gradually attenuate into rather thick (0.3–0.5 mm wide), short tip with weakly developed disk and 11–14 spinose- and short-pilose longitudinal ribs; pappus white, 6–7 mm long; pappus hairs, with difficulty falling in clusters.

6–7 mm long, white, comprising scabrous, thin, soft hairs, connate at base into ring and with difficulty falling in clusters. Chromosomes $2n = 16$. Flowering July to September. (Plate XXX, Fig. 1.)

More or less saline meadows and saline lands.—*Eastern Siberia*: Dauria (vicinity of Nerchinsk; near Lake Tarei in Borzya District; between villages of Kailastui and Duroi on Amguni River). *General distribution*: Described from Lake Tarei in Chita Region. Type (lectotype) in Leningrad. Duplicates of type in Leningrad and Geneva.

Note. A highly distinctive species, undoubtedly belonging to the genus *Youngia* Cass. on the basis of the achene morphology.

Section 2. *Crepidopsis* Bab. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 25 (The Genus *Youngia*.—*Barkhausia* sect. *Aegoseris* (Rchb.) DC. Prodr. VII, 1 (1838) 154, p. min. p. —*Crepis* sect. *Eucrepis* DC. op. cit. (1838) 161, p. min. p.—*Berinia* subgen. *Ceratob- rinia* Sch. Bip. in Jahresbreicht Pollichia XXII–XXIV (1866) 316.—*Crepis* sect. *Barkhausia* auct. p. p. non Gaudin: Popov, Fl. Sr. Sib. II (1959) 779.—Plants perennial, glabrous (except axils of basal leaves, involucre bracts, and corolla tube); taproot thick, with simple or sparingly branched, short, (0.7)1–5(7) cm thick caudex, covered with remnants of petioles of dead basal leaves. Stems solitary or few, less often numerous, branched from middle or base, with long, divergent, obliquely upward-directed or divaricate lateral branches. Basal leaves pinnatisect or deeply pinnatifid, with oblong, lanceolate, linear, less often linear-filiform, entire, toothed or divided (with one or two teeth or narrow lobes on each side) lateral segments, long petiolate; lower and middle leaves more or less similar to basal; upper cauline leaves usually entire, linear or linear-filiform, sessile; uppermost leaves bract-like. Capitula small or medium, with 8–16-florets, in lax corymbose or paniculate-corymbose inflorescence. Outer involucre bracts one-fifth to two-fifths as long as inner, oblong-lanceolate, acute. Receptacle usually finely pitted. Corolla 11–20 mm long with 2–3(4) mm long tube, scatteredly puberulent. Achenes black, less often dark-brown, 3.7–7 mm long and 0.7–1 mm wide, fusiform, distinctly compressed dorsally, gradually narrowed upward into short, thick or thickish (0.3–0.6 mm wide) tip with weakly developed disk, or attenuate into short, more or less thin (0.2–0.3 mm wide) beak-like structure abruptly expanded at apex into almost flat disk, with 10–12(13) spinose and puberulent longitudinal ribs; pappus white, 4–7 mm long; pappus hairs falling singly, rather easily or with difficulty.

Type of section: *Y. tenuifolia* (Willd.) Bab. and Stebbins.

The section comprises four species, which were considered by Babcock and Stebbins (1. c.) as subspecies of a broadly interpreted *Y. tenuifolia* (Willd.) Bab. and Stebbins. They distinguish 12 polyploid

apomictic races within the limits of these subspecies without assigning special names. The number of variant forms is fairly large. These create some difficulties in the delimiting of the species. They can be understood only through special cytological studies.

2. **Y. diversifolia** (Ldb.). Fl. Ross. II, 2 (1846) 837, p. p.; O. and B. Fedtsch. Perech. Rast. Turk. IV, 349, p. p.—*Y. tenuifolia* ssp. *diversifolia* (Ldb.) Bab. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 54 (The Genus *Youngia*.—*Prenanthes diversifolia* Ldb. in Spreng. Syst. veg. III (1826) 657; Ldb. Ic. pl. Fl. Ross. II (1830) 17 and Fl. alt. IV (1833) 143, p. p.—*Crepis baicalensis* auct. p. p. non Ldb.: DC. Prodr. VII, 1 (1838) 161.—*C. tenuifolia* auct. p. p. non Willd.: Kryl. Fl. Alt. III (1904) 761 and Fl. Zap. Sib. XI, 3042.—*C. diversifolia* (Ldb.) B. Fedtsch. Rast. Turk. (1915) 765 p. p.—**Ic.**: Ldb. Ic. pl. Fl. Ross. II, t. 152; Bab. and Stebbins, op. cit. fig. 12, k–q.

Perennial. Taproot woody, thick, long, vertical, with woody, short and weakly branched or simple, 1–7 cm thick caudex, covered with dark brown remnants of petioles of dead basal leaves. Stems few or solitary, 10–40 cm high, 1–3(4) mm thick at base, erect, cylindrical, longitudinally striate, solid, branched from middle, less often almost from base, with obliquely upward-directed branches, leafy, green or violet below, glabrous together with glaucous-green leaves, sometimes sparsely crisped-hairy below capitula. Basal leaves numerous, (3)5–25(30) cm long (including petiole) and (0.7)1–6 cm wide, pinnatisect or deeply pinnatifid, with narrow-lanceolate, linear, very rarely linear-filiform, acuminate or acute, 381 entire, toothed or divided segments (with one or two teeth or narrow lobes on each side), sometimes partly pinnatilobate or irregularly toothed, on long, non-winged petioles, strongly thickened at base, leaf axils densely tomentose from dirty rusty hairs, almost as long as lamina or two-thirds as long, not withering before flowering; lower and middle cauline leaves like basal, upper, and often also middle cauline leaves, entire, linear or linear-filiform, sessile, nonamplexicaul; uppermost leaves very small, sometimes with isolated crisped hairs. Capitula numerous, with 10–16-florets, on erect or slightly bent, slender, 0.5–3 cm-long peduncles, in lax corymbose inflorescence. Involucre broadly cylindrical, (9)10–14 mm long and (3.5)4–6 mm wide (at beginning of flowering); involucre bracts covered with more sparse, somewhat long, grayish, non-glandular, crisped hairs on outer surface, with well-developed, narrow, bent horn near apex; outer bracts five to seven, oblong-lanceolate, acute, unequal, without membranous border, 2–5 mm long; inner bracts (seven) eight (nine), oblong-linear, obtuse, all equal, with membranous border (innermost), with one prominent vein, crisped hairy at tip along margin, glabrous inside. Receptacle indistinctly pitted, smooth. Florets yellow, one and one-half to

two times as long as involucre; corolla 12–20 mm long: ligules up to 3 (3.25) mm wide; corolla tube 2.5–4 mm long, scatteredly puberulent with acicular, scabrous hairs; style branches yellow. Achenes similar, dark brown, less often black, (5)6–7 mm long and 0.8–1 mm wide, fusiform, distinctly compressed laterally, gradually narrowed into short, rather thicktip, 0.5–1(1.5) mm long and about 4 mm wide, with weakly developed yellowish disk and with 10–12 obtuse, unequally thick ribs, densely covered with short (under high magnification of binocular microscope!), upward-directed spines; pappus comprising 6–7 mm long, white, scabrous, thin, soft hairs, easily falling singly. Flowering July to August.

Dry stony and rubbly slopes, rocks, stony steppes, up to 4,000 m.—*Western Siberia*: Altai; *Soviet Central Asia*: Dzhungaria-Tarbagatai, Balkhash (Kent Mountains in Karaganda Region), Tien Shan (central and eastern Tien Shan), Pamiro-Alai (eastern Pamir). *General distribution*: Dzhungaria-Kashgaria (western part), Indo-Himalayas (western Himalayas). Described from the Altai. Type in Leningrad.

3. **Y. tenuifolia** (Willd.) Bab. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 46, p. p. (The Genus *Youngia*).—*Y. diversifolia* (Ldb.) Ldb. Fl. Ross. II, 2 (1846) 837, p. p.—*Y. tenuifolia* ssp. *typica* Bab. and Stebbins, op. cit. (1937) 48, excl. syn. *Crepis graminifolia* Ldb.—*Crepis tectorum* auct. non L.: Pall. Reise II (1773) 522.—*C. tenuifolia* Willd. Sp. pl. III, 3 (1803) 1606; Turcz. in Bull. Soc. Nat. Mosc. XI (1838) 96 (Cat. baic. No. 715); Kom. and Alis. Opređ. Rast. Dal'nevost. Kraya II, 1101; Kryl. Fl. Zap. Sib. XI, 3042, p. min. p.; Karavaev, Konsp. Fl. Yakutii, 179; Popov, Fl. Sredn. Sib. II, 779.—*C. baicalensis* Ldb. in Mém. Acad. Sc. Pétersb. V (1812) 559; DC. Prodr. VII, 1 (1838) 161, p. p.—*C. pulcherrima* Fisch. ex Link, Enum. pl. hort. Berol. II (1822) 291, nomen in adnot.; DC. op. cit. 155, pro syn. non Grossh. (1920).—*C. elegans* Fisch. ex DC. op. cit. (1838) 161, pro syn. non Hook. (1834).—*C. pectinata* Steph. ex Herd. in Bull. Soc. Nat. Mosc. XLIII, 2 (1870) 197, pro syn. non Lowe (1833).—*Lagoseris tenuifolia* (Willd.) Rchb. Icon. pl. crit. I (1823) t. X, figs. 19, 20.—*Barkhausia tenuifolia* (Willd.) DC. op. cit. (1838) 155, excl. syn. nonnull.; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 106, excl. syn. *Prenanthes diversifolia* Ldb. (Fl. baic.-dahur.).—*Chondrilla baicalensis* (Ldb.) Sch. Bip. in Muss. Senkenberg. III (1839) 49, in obs. 2.—*Berinia tenuifolia* (Willd.) Sch. Bip. in Jahresbericht Pollinia XXII–XXIV (1866) 316; Herd. op. cit. 197, p. p.—*Brachyderea tenuifolia* (Willd.) Sch. Bip. Cichoriaceotheca, No. 57; Herd. op. cit. 197, pro syn.—*Hieracioides tenuifolium* (Willd.) O. Ktze. Rev. gen. I (1891) 346, "*Hieraciodes*".—**lc.**: Gmel. Fl. sibirica II (1749) t. VI; Bab. and Stebbins, op. cit. fig. 9.—**Exs.**: Sch. Bip. Cichoriaceotheca, No. 57.

Perennial. Taproot woody, thick, long, vertical, with short, woody, 1–4(6) cm thick, or with few-headed caudex, covered with dark brown remnants of petioles of dead basal leaves. Stems few, less often solitary, 15–50(60) cm high, 1.5–3.5–(5) cm thick at base, erect, cylindrical, longitudinally striate, solid, branching above base or from middle, less often only in upper part, with erect, obliquely upward-directed or rather strongly divergent branches, leafy, green, or violet below, glabrous together with glaucous-green leaves, less often sparsely crisped-hairy below capitula. Basal leaves numerous, 5–20(28) cm long and 2–6(8) cm wide, pinnatisect or deeply pinnatipartite, with oblong, lanceolate, linear, less often linear-filiform, usually acuminate, entire, toothed or divided lateral segments (with one or two teeth or lobes on each side) or 6–12 pairs of lobes and terminal segment not larger than laterals, very rarely lyrate or irregularly toothed, on long, non-winged, basally strongly expanded petioles, leaf axils densely tomentose from dirty rusty hairs, almost as long or two-thirds as long as lamina, leaves not withering before flowering; lower and middle cauline leaves like basal; upper cauline leaves pinnatipartite, pinnatilobate or entire, and then linear or linear-filiform, sessile, non-amplexicaul; apical leaves very small, sometimes with individual crisped hairs. Capitula usually numerous, with 8–15-florets, on erect or slightly bent, slender, 0.3–2 cm long peduncles, in lax corymbose inflorescence. Involucre cylindrical, 8–10.5(11) mm long and 2.5–3.5(4) mm wide (at beginning of flowering); outer surface of involucre bracts covered with more or less dense or scattered, somewhat long, grayish, eglandular, crisped hairs, very rarely glabrous, with well-developed, narrow, bent horns near apex; outer bracts five to seven, oblong-lanceolate, acute, unequal, with membranous border, one-fourth to two-fifths as long as inner; inner bracts (seven) eight (nine), oblong-linear, obtuse, equal, with narrow membranous border (innermost), and one prominent vein, crisped-hairs along margin at apex, glabrous inside. Receptacle finely pitted, smooth. Florets yellow, one and one-half to two times as long as involucre; corolla 11–15 mm long; ligules up to 3 mm wide; corolla tube 2.5–3 mm long, scatteredly puberulent with acicular, scabrous hairs; style branches yellow. Achenes similar, black, 4.5–7 mm long and 0.7–1 mm wide, fusiform, distinctly compressed dorsally, gradually narrowed above into short, yellowish, more or less thin, beak-like structure, 0.7–1.5(2) mm long and 0.2–0.3 mm wide, abruptly expanded at apex into almost flat disk, with 10–12(13) obtuse, unequally thick ribs, densely covered with short (under high magnification of binocular microscope!), upward-directed spines and very short, almost appressed, hairs between ribs (especially immature achenes); pappus comprising 4–6 mm long, white, scabrous, thin and soft hairs, falling singly with difficulty. Flowering July to September.

Rocks, dry stony and rubbly slopes, stony steppes; in lower and middle mountain belts.—*Western Siberia*: Ob' (southeastern part); *Eastern Siberia*: Yenisei (southern part), Angara-Sayans, Dauria, Lena-Kolyma; *Far East*: Zeya-Bureya (eastern part), Uda area (northern part), Okhotsk (Dzhugdzhur Range; vicinity of Ayan). *General distribution*: Mongolia (northern part), China (northeastern part). Described from Siberia ("Tauria" wrongly indicated as native region by Willdenow). Type was in Berlin.

Note. In this species, two varieties are distinguished: var. *lanciloba* (Freyn) Czer. comb. nova. (*Y. diversifolia* var. *lanciloba* Freyn in *Oesterr. Bot. Zeitschr.* XL (1890) 45; *Y. tenuifolia* var. *latiloba* M. Pop. *Fl. Sredn. Sib.* II (1959) 780, descr. rossica); leaves with lanceolate or oblong segments; common; and var. *tenuiloba* (Freyn) Czer. comb. nova *Y. diversifolia* var. *tenuiloba* Freyn, op. cit. (1890) 45; *Y. tenuifolia* var. *tenuiloba* M. Pop. op. cit. (1959) 780, descr. rossica, non Freyn]; leaves with linear-filiform or linear segments, shorter, xerophilous; more rare.

4. ***Y. altaica*** (Babc. and Stebbins) Czer. comb. nova.—*Y. diversifolia* (Ldb.) Ldb. *Fl. Ross.* II, 2 (1846) 837, p. p.—*Y. diversifolia* var. *altaica* (Bong. and Mey.) O. and B. Fedtsch. *Perech. Rast. Turk.* IV (1911) 346, nomen.—*Y. tenuifolia* ssp. *altaica* Babc. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 50, descr. (*The Genus Youngia*).—*Prenanthes diversifolia* Ldb. *Fl. alt.* IV (1833) 143, p. p.—*Crepis baicalensis* auct. p. p. non Ldb.: D.C. *Prodr.* VII, 1 (1838) 161.—*C. tenuifolia* β . *altaica* Bong. and May. *Verzeichn. Saisang-Nor u. Irtysh gesammelt. Pfl.* (1841) 44, nomen.—*C. tenuifolia* auct. p. p. non Willd.: Kryl. *Fl. Alt.* III (1904) 761 and *Fl. Zap. Sib.* XI, 3042.—*C. diversifolia* (Ldb.) B. Fedtsch. *Rast. Turk.* (1915) 765, p. p.—**lc.**: Babc. and Stebbins, op. cit. fig. 10.—**Exs.**: Kar. and Kir. *Pl. Songor*, No. 884.

Perennial. Tap root woody, thick, long, vertical, with woody, short- and weakly branched or simple, 1–3(5) cm thick caudex, covered with dark brown remnants of petioles of dead basal leaves. Stems few or solitary, less often numerous, 12–35(40) cm high, 1–3 cm thick at base, erect, cylindrical, longitudinally striate, solid, divaricately branched above base or from middle, with obliquely upward-directed or spreading branches, leafy, green or violet below, glabrous, together with glaucous-green leaves. Basal leaves numerous, 4–16(20) cm long (including petiole), pinnatisect, with linear-filiform or narrowly linear, acuminate, entire, toothed segments or divided into one or two narrow lobes on each side, on long, non-winged, basally strongly expanded petioles, axils densely tomentose from dirty rusty hairs, as long or two-thirds as long as lamina, leaves withering before flowering; lower and middle cauline leaves like basal; upper cauline leaves mostly entire, linear-filiform or narrowly linear, sessile, non-amplexicaul; apical leaves very small. Capitula numerous,

with 9 or 10-florets, on erect or slightly bent, slender, 0.2–2(3) cm long peduncles, in lax corymbs. Involucre cylindrical, 7.5–9.5(10.5) mm long and 2.5–3.5 mm wide (at start of flowering); involucre bracts covered outside with very short, grayish, nonglandular hairs, almost farinose, very rarely glabrous, with well-developed, narrow, bent horns near apex; outer bracts five to seven, oblong-lanceolate, acute, unequal, without membranous border, 1–3 mm long; inner bracts six to eight, oblong-linear, obtuse, all equal, with narrow membranous border (innermost), with one prominent vein, crisped-hairy along margin at apex, glabrous inside. Receptacle smooth or finely pitted, glabrous. Florets yellow, one and one-half to two times as long as involucre; corolla 11–14 mm long, ligule to 2(2.5) mm wide; corolla tube 2–3 mm long, scatteredly puberulent with acicular scabrous hairs; style branches yellow. Achenes similar, black or brownish-black, 3.7–5(5.5) mm long and 0.7–1 mm wide, fusiform, distinctly compressed dorsally, gradually narrowed above into short, thick, to 0.5(0.7) mm long and 0.4–0.6 mm wide tip with weakly developed yellowish disk, with 10–12, obtuse, unequally thick ribs, densely covered with short (under high magnification of binocular microscope!), upward-directed spines, and very short, more or less appressed-hairy between ribs; pappus of 4–5 mm long, white, scabrous, thin and soft hairs, more or less easily falling singly. Flowering July to August (September).

Dry stony and rubbly slopes, rocks, stony steppes.—*Western Siberia*: Altai, Irtysh (southeastern part); *Soviet Central Asia*: Dzhungaria-Tarbagatai. *General distribution*: Possibly occurs in Dzhungaria. Described from vicinity of Lake Zaisan. Type in New York.

5. **Y. tenuicaulis** (Babc. and Stebbins) Czer. comb. nova.—*Y. tenuifolia* ssp. *tenuicaulis* Babc. and Stebbins in Carnegie Inst. Washington Publ. 484 (1937) 52 (The Genus *Youngia*) **lc.**: Babc. and Stebbins, op. cit. pl. 1 and Fig. 11.

Perennial. Plant glabrous throughout (including involucre bracts), semishrub; taproot woody, thick, long, vertical, with woody, shortly branched, less often simple, (0.7)1–4 cm thick caudex, covered with dark brown remnants of petioles of dead basal leaves. Stems numerous, 10–22 cm high, less often taller, slender, 0.5–1.3 mm thick at base, erect, cylindrical, longitudinally striate, solid, usually strongly divaricately branched almost from base, leafy, green. Basal leaves numerous, 3–10(13) cm long (including petiole) and 0.5–3 cm wide, pinnatisect, with narrowly linear, acuminate or acute, entire, or divided into one or two narrow lobes on each side, less often somewhat lyrate or irregularly toothed, on long, nonwinged, basally strongly thickened, petioles, leaf axils sometimes densely tomentose from dirty rusty hairs, almost as long or shorter than lamina, leaves not withering before flowering; lower and middle cauline

leaves like basal; upper, often also middle cauline leaves, entire, narrowly linear or linear-filiform, sessile, nonamplexicaul; apical leaves very small. Capitula numerous, with 10–12-florets, (0.5)1–3(4.5) cm long, in lax corymbose or paniculate-corymbose inflorescence. Involucre cylindrical, 7–9 mm long and 2.5–3(3.5) mm wide (at start of flowering); involucre bracts dorsally with well-developed, narrow, bent horns at tip; outer involucre bracts 5–10, ovate or oblong-lanceolate, acute, unequal, without membranous border, 1–3 mm long; inner bracts five to eight, oblong-linear, obtuse, unequal, with narrow membranous border (innermost), with one prominent vein, crisped-hairy along margin at apex, glabrous inside. Receptacle reticulate, glabrous. Florets yellow, one and one-half times as long as involucre; corolla 11–11.5 mm long; ligule up to 2 mm wide; corolla tube 1.5–2 mm long, scatteredly puberulent with acicular scabrous hairs; style branches yellow. Achenes similar, black, 4–5.5 mm long and 0.7–0.8 mm wide, fusiform, slightly compressed dorsally, gradually narrowed above into short, thickened, up to 0.7 mm-long and 0.3–0.4 mm-wide tip with weakly developed yellowish disk, and 10–11 obtuse, unequally thick ribs, densely covered with short (under high magnification of binocular microscope!), upward-directed spines; pappus of 4–6 mm-long, white, scabrous, thin and soft hairs, more or less easily falling singly. Flowering July to August (September).

Dry stony and rubbly slopes, rocks, stony steppes.—*Western Siberia*: Altai (southern part of Gorno-Altai Autonomous Region); *Eastern Siberia*: Angara-Sayans (Tuva); *Soviet Central Asia*: Tien Shan (eastern part). *General distribution*: Dzhungaria-Kashgaria (Dzhungaria), Mongolia. Described from Mongolia. Type in Berkeley, California.

Section 3. Pseudo-ixeridopsis Czer. in Addenda XXVIII, 727.—Plants perennial, throughout glabrous (sometimes involucre bracts with one row of eglandular, setose hairs); tap root more or less slender, with simple or weakly branched, short, 0.3–2 cm thick caudex, covered with remnants of petioles of dead basal leaves. Stems one or two (three), branched from middle or base, with long, erect, obliquely upward-directed or divergent branches. Basal leaves mostly lanceolate or oblanceolate, sinuate-toothed, pinnatifid or pinnatifid-partite, with triangular or linear, usually entire lobes, leaves less often entire, on winged and short petioles; cauline leaves few, sessile; lower cauline leaves like basal; middle and upper cauline leaves strongly reduced, narrowly linear, entire or, apical leaves bract-like. Capitula medium, with 4–9(11)-florets in lax corymbs. Outer involucre bracts one-fifth to one-third as long as inner, shortly ovate or oblong-ovate, obtuse. Receptacle smooth, glabrous. Corolla 13–20 mm long, with glabrous, 2.5–4.5 mm-long tube. Immature achenes yellowish or dark brown, 7–9 mm long and 0.7–1 mm wide, fusiform, distinctly

compressed dorsally, slightly narrowed above, with more or less distinct, broad disk at apex, ribbed (probably with 10–12 unequally thick ribs), glabrous; pappus pale, rusty, 7–7.5 mm long; pappus hairs somewhat stiff, persistent.

Type of section: *Y. serawschanica* (B. Fedtsch.) Babc. and Stebbins.

The single species of this section is distinguished from the species of section *Crepidopsis* Babc. and Stebbins by the less dissected, winged and short-petiolate basal leaves; sessile, for the most part strongly reduced (except the lower ones), often bract-like cauline leaves; fewer florets in the capitulum; form of the outer involucre bracts; smooth receptacle; glabrous corolla tube and achenes; and the pale rusty pappus of stiffish hairs, approaching section *Ixeridopsis* Babc. of the genus *Crepis* L. in some characters.

6. *Y. serawschanica* (B. Fedtsch.) Babc. and Stebbins in Univ. Calif. Publ. Bot. 18 (1943) 231; Kovalevskaja in Fl. Uzb. VI, 497.—*Y. distincta* 387 M. Pop. and Vved.) Babc. and Stebbins, op. cit. (1943) 233—*Crepis serawschanica* B. Fedtsch. in O. and B. Fedtsch. Perech. Rast. Turk. IV (1911) 343 and in Beih.-Bot. Centralbl. XL (1923) 203.—*C. distincta* M. Pop and Vved. in Bull. Soc. Nat. Mosc. sect. biolog. nouv. sér. XIII, 2 (1933) 147.—*lc.*: M. Pop. and Vved. l.c. fig. 7; Babc. and Stebbins, op. cit. fig. 3, 4; Kovalevskaja, op. cit. Plate L, Fig. 2.

Perennial. Tap root woody, more or less slender, long, vertical, with woody, simple or weakly branched, 0.3–2 cm thick caudex, covered with dark brown remnants of petioles of dead basal leaves. Stems one or two (three), (8)10–40 cm high, erect, cylindrical, longitudinally striate, solid, divaricately branched from middle or base, with obliquely upward-directed or rather strongly divergent branches, less leafy, green, glabrous together with glaucous-green leaves. Basal leaves numerous, 4–14 cm long (including petiole) and (0.3)0.5–2(2.5) cm wide, lanceolate, oblanceolate, or oblong-oblanceolate, less often linear or oblong-obovate, acuminate, acute, sometimes obtuse, irregularly sinuate-toothed, pinnatilobate or runcinate pinnatipartite, with triangular or linear, usually acute and entire lobes, less often entire, gradually narrowed into short, winged, basally strongly expanded petiole, and not withering before flowering; cauline leaves sessile, nonamplexicaul; lower cauline leaves like basal, middle and upper cauline leaves strongly reduced, narrowly linear, acute, entire or, like apical leaves, very small, bract-like. Capitula few, less often somewhat numerous, with 4–9(11)-florets, on erect or slightly bent, slender, 0.7–7 cm-long peduncles, in spreading corymbs. Involucre cylindrical or cylindrical-campanulate, 9–12 mm long and 3–4 mm wide (at start of flowering), sometimes with individual arachnoid hairs at base; outer involucre bracts three to five, broadly ovate or oblong-ovate, obtuse,

entire or obtusely and finely toothed, mostly unequal, without membranous border, glabrous outside, with apical tubercle, 1.5–4 mm long; inner involucre bracts five or six(eight), narrowly oblong, all equal, with narrow membranous border (innermost), and one prominent vein, glabrous on both sides or covered with erect, longer, eglandular, yellowish setose hairs along midrib on outer surface, with distinct black tubercle or horn above, with crisped, white hairs along margin at apex. Receptacle smooth, glabrous. Florets yellow, ligule purple on outer side, one and one-half to two times as long as involucre; corolla 13–20 mm long; ligule up to 3–3.5 mm long; corolla tube 2.5–4.5 mm long, glabrous; style branches yellow; immature achenes similar, yellowish or dark brown, 7–9 mm long and 0.7–1 mm wide, fusiform, distinctly appressed dorsally, slightly
 388 narrowed above, with more or less distinct, broad disk at apex, indistinctly ribbed (possibly, with 10–12 unequally thick ribs), glabrous; pappus 7–7.5 mm long, pale rusty, of toothed, persistent hairs. Flowering July to August. (Plate XXX, Fig. 3.)

Stony and rubbly slopes; in middle and subalpine mountain zones, to 3,500 m.—*Soviet Central Asia*: Tien Shan (Talass Alatau, Ugam, Pskem, Sandalash and Kuramin ranges), Pamiro-Alai (northwestern part, in south up to northern slope of Hissar Range). Described from Zeravshan. Type (lectotype) and paratypes in Leningrad.

GENUS 1662. *Ixeridium* (A. Gray) Tzvel.^{1,2}

Ixeris (sect.?) *Ixeridium* A. Gray in Mem. Amer. Acad. n. s. VI (1859) 397.—*I.* sect. *Ixeridium* (A. Gray) Kitam. in Bot. Mag. Tokyo XLIX (1935) 281 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1 (1956) 108.

Capitula usually numerous, borne at apices of main stem and its branches, in lax corymbose-paniculate inflorescence, less often solitary, homogamous, with 5–25 bisexual ligulate florets. Involucre cylindrical, 6–11 mm long and 2–3.5 mm wide; outer involucre bracts two to six, irregularly arranged and variable in shape, very small (2–3 mm long); inner bracts (seven) eight (nine), in one row, broadly linear, obtuse, narrowly membranous along margin, with distinct midrib, glabrous or more or less covered with very small light-colored glands (visible only under high magnification). Receptacle flat, glabrous, irregularly alveolate. Ligulate flowers yellow, pink, purple or whitish, one and one-half to two times as long as involucre, with five rather long teeth at apex; corolla

¹ Treatment by N.N. Tzvelev.

² Derived from the generic name *Ixeris* Cass, which itself originates from the Indian name of the plant.

tube smooth, 2–4 mm long; filaments glabrous; anthers with subobtusetriangular apical appendage, basally sagittate; style bifid, almost filiform. Achenes 3.5–7 mm long and 0.5–0.7 mm wide; fusiform, weakly flattened dorsally, brownish, with (9)10(12) prominent, somewhat thick ribs, spinulose along ribs (mainly in upper part), gradually terminating at apex in thin, light-colored, 1–3 mm-long beak; pappus of numerous scabrous, 4–5.5 mm-long bristles, one-rowed and persistent. Perennial, glabrous, herbaceous plants with more or less long rhizomes; stems often numerous, arising from base, erect or ascending, usually only with few alternate leaves; leaves oblong to narrowly linear, entire, more or less toothed, pinnatilobate or pinnatipartite, basal leaves in rosette persisting at flowering time, cauline leaves sessile, often amplexicaul.

389 Type of genus: *I. dentatum* (Thunb.) Tzvel.

About 20–25 species of this genus are distributed in Southeast Asia, including the Malayan Archipelago. Of these, five species are found in the USSR.

Note. Belonging to this genus is a group of species treated, until recently, as a section of the genus *Ixeris* Cass. However, the type species of the latter genus, *I. polycephala* Cass., a widespread weed of the tropical and subtropical countries of Southeast Asia, differs markedly from the species of the genus *Ixeridium* in both the growth habit (annual) and the morphology of the achenes, which have almost smooth, winged ribs. In my view, the genus *Ixeridium* shows an even closer affinity with certain sections of the genus *Youngia* Cass. and with the genus *Paraixeris* Nakai than with the genus *Ixeris* Cass. *sensu stricto*.

1. Achenes 3.5–5 mm long, with 1–1.5 long beak; capitula with six- to eight-florets; cauline leaves amplexicaul, more or less toothed, teeth usually long-cuspidate 5. ***I. dentatum*** (Thunb.) Tzvel.
- + Achenes 4–7 mm long, with 2–3 mm-long beak; capitula with 15–25-florets; cauline leaves sessile, narrowed toward base or amplexicaul, variable in form; if toothed, then teeth with short cusps 2.
2. Cauline leaves (excluding very small apical leaves) two to four, with broad amplexicaul base; involucre 6–8 mm long; plants 15–35 cm high, usually with many stems arising from base 1. ***I. chinense*** (Thunb.) Tzvel.
- + Cauline leaves (none) one or two (three), more or less narrowed toward base, not amplexicaul or semiamplexicaul 3.
3. Involucre 8.5–11 mm long; achenes 5.5–7 mm long; plants 15–50 cm high, with solitary or few stems arising from base 2. ***I. strigosum*** (Lévl. and Vaniot) Tzvel.

- + Involucre 6–8.5 mm long; achenes 4–5.5 mm long; plants (5)10–30(40) cm high, usually with many stems arising from base 4.
- 4. Basal leaves very narrow, filiform-linear, usually entire, less often with inconspicuous lateral lobes; capitula few, (1)3–10(15) per stem; plants up to (15)20 cm high 4. **I. graminifolium** (Ldb.) Tzvel.
- + Basal leaves broader, usually more or less pinnatifid or pinnatifid, less often entire, but then not filiform-linear, more than 2 mm wide; capitula more numerous; plants up to 30(40) cm high 3. **I. gramineum** (Fisch.) Tzvel.

Series 1. Chinensia Tzvel.—Capitula with (15)18–25(27) flowers; achenes 4–6 mm long, with 2–3 mm long beak; pappus hairs whitish.

390 **Note.** To this series belongs a group of very close species connected by intermediates, treated by Kitamura (1956) as subspecies of a single polytypic species, *I. chinense* (Thunb.) Tzvel. sensu lato.

1. **I. chinense** (Thunb.) Tzvel. comb. nova.—*Prenanthes chinensis* Thunb. Fl. Jap. (1784) 301, p. p.—*Youngia chinensis* (Thunb.) DC. Prodr. VII (1838) 194.—*Ixeris chinensis* (Thunb.) Nakai in Bot. Mag. Tokyo XXXIV (1920) 152; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1 (1956) 112.

Perennial. Plants 15–35 cm high, usually with many stems arising from base, glabrous; stems erect, less often ascending from base. Basal leaves rosulate, and usually persistent at flowering time, oblanceolate or obovate, entire to more or less pinnatifid, gradually narrowed toward base, green or weakly glaucous; cauline leaves two to four, sessile, with broad amplexicaul base, usually oblong or lanceolate-ovate, more or less toothed to almost entire, green above, glaucous-green beneath. Capitula numerous, in lax corymbose-paniculate inflorescence; involucre 6–8 mm long. Florets yellow, often more or less pink on drying(?), 20–25. Achenes brownish, 4–6 mm long; pappus whitish, 4–5 mm long. Flowering June to July.

Usually an introduced plant of roadsides, habitations, in crop fields, less frequently on stony slopes of lower mountain zone.—*Eastern Siberia*: Dauria (rarely in Argun Basin); *Far East*: Zeya-Bureya (rarely), Ussuri (rarely). *General distribution*: eastern China, Korean Peninsula, Japan (Ryukyu Islands), Vietnam. Described from China. Type in Uppsala.

Note. I did not see type (and authoritatively identified in general) specimens of either this or the following species, and they are described entirely on the basis of S. Kitamura. (1956).

2. **I. strigosum** (Lévl. and Vaniot) Tzvel. comb. nova.—*Lactuca strigosa* Lévl. and Vaniot in Bull. Acad. Géogr. Bot. XX Mém. (1909) 114.—*Ixeris chinensis* var. *strigosa* (Lévl. and Vaniot) Ohwi, Fl. Jap. (1953) 1246.—*I. chinensis* subsp. *strigosa* (Lévl. and Vaniot) Kitam. in Bot. Mag. Tokyo XLIX (1935) 283 and in Mem Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1 (1956) 112.

Perennial. Plants 15–50 cm high, usually with solitary or few stems arising from base, smooth. Stems erect, less often ascending from base. Basal leaves rosulate, persisting at flowering time, oblanceolate or oblong-oblanceolate, more or less toothed to pinnatipartite, gradually narrowed toward base, usually more or less glaucous-green; cauline leaves one or two, sessile, gradually narrowed toward base or semiamplexicaul, usually lanceolate or oblong, entire to pinnatilobate. Capitula numerous, in lax corymbose-paniculate inflorescence. Involucre 8.5–11 mm long. Florets yellow or yellowish-white with more or less pink or purple tinge, usually pinkish on drying, 20–25. Achenes brownish, 5.5–7 mm long; pappus whitish, 4.5–5.5 mm long. Flowering June to July.

Meadows and loosely turfey grass slopes, on sand and gravels of river valleys, often also as weed in crop fields and roadsides.—*Far East*: Zeya-Bureya (rarely along Amur River), Ussuri. *General distribution*: northeastern China (rarely), Korean Peninsula, Japan. Described from Korean Peninsula. Type in Paris.

3. **I. gramineum** (Fisch.) Tzvel. comb. nova.—*Prenanthes graminea* Fisch. in Mém. Soc. Nat. Mosc. III (1812) 67.—*Lagoseris versicolor* Fisch. ex Link, Enum. pl. hort. berol. II (1822) 289.—*Barkhausia versicolor* (Fisch. ex Link) Spreng. Syst. Veg. III (1826) 651.—*Prenanthes versicolor* Fisch. ex Bunge, Enum. pl. China bor. (1832) 40 nom. nud.—*Lactuca fischeriana* DC. Prodr. VII (1838) 135.—*Ixeris versicolor* (Fisch. ex Link) DC. op. cit. 151; Ldb. Fl. Ross. II, 2 (1846) 817, p. p. —*Lactuca versicolor* (Fisch. ex Link) Sch. Bip. apud Herd. in Bull. Soc. Nat. Mosc. XLIII, 1 (1870) 109; Kom. and Alis. Opred. II (1932) 1098.—*Ixeris scaposa* Freyn in Oesterr. Bot. Zeitschr. XL (1890) 44.—*I. graminea* (Fisch.) Nakai in Bot. Mag. Tokyo XXXVI (1922) 23.—*I. chinensis* subsp. *versicolor* (Fisch. ex Link) Kitam. in Bot. Mag. Tokyo XLIX (1935) 283 and Mem. Coll. Sc. Univ. Kyoto ser. B, XXIII, 1 (1956) 112.

Perennial. Plants (5)10–30(40) cm high, usually many-stemmed from base, glabrous. Stems erect or ascending from base. Basal leaves rosulate, persisting at flowering time, oblong-oblanceolate to linear, entire, toothed, pinnatilobate or pinnatipartite, gradually narrowed toward base, usually more or less glaucous-green; cauline leaves (excluding very small apical leaves) none to two, sessile, gradually narrowed toward base, less often semiamplexicaul, oblong-linear, entire or more or less pinnatilobate.

Capitula usually numerous, borne in lax corymbose-paniculate inflorescence, less often 3–10. Involucre 7.5–8.5 long. Florets 15–27, variable in color: pink, yellow, whitish. Achenes brownish, 4–5.5 mm long; pappus whitish, 4–4.5 mm long. Flowering June to July.

Meadows, stony slopes, among shrubs, sands and gravels in river valleys, often as weed in crop fields and roadsides.—*Eastern Siberia*: Angara-Sayans (eastern part), Dauria, Lena-Kolyma (eastern part); *Far East*: Uda area (rarely), Zeya-Bureya, Ussuri. *General distribution*: Mongolia (eastern part), China (northern and middle parts), Korean Peninsula. Described from former Irkutsk Region. Type in Leningrad.

Note: I did not see the authoritative material of *Lagoseris versicolor* Fisch. ex Link, which was described from garden specimens originating from the Transbaikal Region. However, there are specimens with fully mature achenes among the numerous specimens of *I. gramineum* from the herbarium of F. Fischer, which could have been sent to I. Link. The specimens of Link, apparently, had more deeply divided leaves than the type specimen of *Prenanthes graminea* Fisch., collected by Treskin in the former Irkutsk Region and preserved in the Herbarium of Botanical Institute, Academy of Sciences of the USSR. However, this character is so insignificant that there is no doubt about all of these plants belonging to a single species. *Ixeris scaposa* Freyn occupies as it were, an intermediate position between *I. gramineum* and the following species, but having comparatively broad pinnatifid or pinnate basal leaves, was described on the basis of specimens from the region of the town of Nerchinsk, which lack cauline leaves.

4. ***I. graminifolium*** (Ldb.) Tzvel. comb. nova.—*Crepis graminifolia* Ldb. in Mém. Acad. Sc. Pétersb. V (1814) 558. —*Ixeris graminifolia* (Ldb.) Kitag. in Rep. First Sc. Exped. Mansh. sect. 4, IV (1936) 95.

Perennial. Plants (5)10–15(20) cm high, usually with many stems arising from base, glabrous. Stems erect or ascending. Basal leaves rosulate, persisting at flowering time, narrowly linear, often almost filiform, entire, less often with distinct lateral lobes; cauline leaves (excluding very small apical leaves) usually lacking, less often one or two, also narrowly-linear, entire. Capitula usually few, (1)3–10(15) per stem. Involucre 6–8 mm long. Florets pink, yellow or whitish, 15–25. Achenes brownish, 4–5.5 mm long; pappus whitish, 4–4.5 mm long. Flowering June to July. (Plate XXIV, Fig.1.)

Alkaline soils, alkaline steppes, gradual and sandy-rubby slopes.—*Eastern Siberia*: Angara-Sanyans (Baikal shore near Irkutsk), Dauria (mainly in Selenga, Shilka and Argun basins). *General distribution*: Mongolia (eastern part), northeastern China. Described from Eastern

Siberia ("inter urb. Jacutiam et Ochotiam"), probably from Transbaikal. Type in Leningrad.

Note. Perhaps, this species is only an ecotype of the previous species with, however, a very definite geographical correlation.

Series 2. *Dentata* Tzvel.—Capitula with (5)6–10(11) flowers; achenes 3.5–5 mm long, with 1–1.5 mm long beak; pappus hairs with weakly brownish-yellow tinge.

5. ***I. dentatum* (Thunb.) Tzvel. comb. nova.**—*Prenanthes dentata* Thunb. Fl. Jap. (1784) 301.—*Youngia dentata* (Thunb.) DC. Prodr. VII (1838) 193 excl. syn.—*Ixeris thunbergii* A. Gray in Mem. Amer. Acad. n. s. VI (1859) 398.—*Lactuca thunbergii* (A. Gray) Maxim. in Bull. Acad. Sc. Pétersb. XIX (1874) 530. —*L. dentata* (Thunb.) Robins. in Philipp. Journ. Sc. III (1908) 218 quoad nom.—*Ixeris dentata* (Thunb.) Nakai, Fl. 393 Sylv. Kor. XIV (1923) 114; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIII, 1 (1956) 115.

Perennial. Plants 20–50 cm high, with few or solitary stems arising from base, glabrous. Stems erect, more or less branched above. Basal leaves rosulate, persisting at flowering time, oblanceolate, 4–15 cm long, obtuse or apiculate, gradually narrowed toward base into more or less winged petiole, more or less toothed, teeth spinescent, less often entire or pinnatilobate, green above, more or less glaucous-green beneath; cauline leaves (excluding very small apical leaves) two or three, broadly lanceolate or lanceolate-oblong, sessile, amplexicaul, with roundish, toothed auricles, usually acuminate (often only in lower half) coarsely toothed, with teeth modified into rather long fimbriate cusps. Capitula usually numerous, in lax corymbose-paniculate inflorescence. Involucre 7–8 mm long and 2–3 mm wide. Florets six to eight, yellow, less often yellowish-white. Achenes brownish, 3.5–5 mm long, with 1–1.5 mm long beak; pappus 4–5 mm long, with weakly brownish-yellow tinge. Flowering July to October.

Stony slopes, sands and gravels near seacoast and in river valleys, roadsides.—*Caucasus*: Western Transcaucasia (as introduced weed in the Batumi Botanical Garden; collected by Dmitrieva, 1948); *Far East*: Kuril Islands (Kunashir, Shikotan and Iturup islands). *General distribution*: eastern China, Korean Peninsula, Japan. Described from Japan. Type in Uppsala.

Note. Kitamura (1956) also reported *I. dentatum* var. *albiflorum* (Makino) Tzvel. comb. nova (= *Lactuca thunbergii* var. *albiflora* Makino in *Bot. Mag. Tokyo* XII, 1899, p. 48) from Kunashir Island, which is distinguished by whitish, 8–11-flowered capitula, and, perhaps, represents a separate ecogeographic race.

GENUS 1663. *Chorisis* DC.^{1,2}

DC. Prodr. VII, 1 (1838) 177.—*Chorisma* D. Don in Edinb. N. Phil. Journ. (1821–1829) 308, non Lindl. (1820)—*Ixeris* (sect.?) *chorisis* (DC.) A. Gray. in Mem. Amer. Acad. n. s. VI (1859) 397.—*Lactuca* sect. *Chorisma* (D. Don) Benth. and Hook. fil. Gen. pl. II (1873) 526; Hoffm. in Pflanzenfam. VI, 5 (1894) 372.—*Ixeris* sect. *Chorisis* (DC.) Kitam. in Bot. Mag. Tokyo XLIX (1935) 280.

394 Capitula solitary or two to five, on rather long (4–10 cm) peduncles arising from nodes of prostrate stems, homogamous, with 12–20 bisexual ligulate florets. Involucre cylindrical, 10–14 mm long and 4–7 mm wide; outer involucre bracts four to eight, irregularly arranged and variable in shape, very small (up to 4 mm long), also modified into very small apical leaves on peduncles; inner bracts eight, in one row, oblong-linear, obtuse, narrowly membranous along margin, with weakly distinct midrib. Receptacle flat, smooth, irregularly pitted. Ligulate florets yellow, often pink on drying, one and one-half to two times as long as involucre, with five rather long, lanceolate teeth at apex; corolla tube glabrous, 3–4 mm long; filaments glabrous; anthers with subobtusely triangular apical appendage basally bifid, styles bifid, almost filiform. Achenes 5.5–7.5 mm long and 1–1.5 mm wide, fusiform, slightly flattened dorsally, brownish, with distinctly thickened porous testa and 10 somewhat weakly raised ribs, with tubercular spinules barely noticeable even under high magnification, more or less glabrous, gradually narrowed into rather thin and lighter-colored, 1–2 mm-long beak at apex; pappus of numerous whitish, 5.5–7 mm long hairs, scabrous from very small spinules, in one row, usually irregularly breaking off together with cupuliform apex of beak. Perennial, entirely glabrous herbaceous plant with prostrate stem rooting at nodes and alternate leaves on long, usually upward directed petioles; laminae divided in 3–5 almost palmate segments.

A monotypic genus.

Note. In recent times, the genus *Chorisis* DC. has usually been combined with the genus *Ixeris* Cass. as a section. However, even ignoring the highly distinctive appearance, the only species of this genus is also well distinguished from the only species of *Ixeris* sensu stricto by the morphology of the achenes, which are covered with a highly thickened, porous testa (an adaptation for dispersal by sea water) with only very slightly projecting, more or less smooth ribs.

¹ Treatment by N.N. Tzvelev.

² From the Greek word *chorisis*—separation or division. So named because of the unique habit of the plant, which is easily propagated vegetatively: multiplication of the prostrate stems by producing roots at nodes.

1. **C. repens** (L.) DC. Prodr. VII (1838) 178.—*Prenanthes repens* L. Sp. pl. (1753) 798.—*Chorisma repens* (L.) D. Don in Edinb. N. Phil. Journ. (1828–1829) 308.—*Nabalus repens* (L.) Ldb. Fl. Ross. II (1846) 840.—*Ixeris repens* (L.) A. Gray in Mem. Amer. Acad. n. s. VI (1859) 397; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B. XXIII, 1 (1956) 128.—*Lactuca repens* (L.) Benth. ex Maxim. in Bull. Acad. Sc. Pétersb. XIX (1874) 532; Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II (1932) 1098.

396 Perennial. Plants wholly glabrous, with few thick, prostrate, stems rooting at nodes. Leaves 4–12 cm long, long-petiolate, without auricles at base, green above, glaucous-green beneath, divided into three to five, almost palmate segments; segments obtuse, irregularly toothed, lobate or entire, petiolulate. Capitula (one) two to five (six), on long (4–10 cm) ascending or erect peduncles arising from nodes; peduncles 1–7 mm long, with few, very small apical leaves. Involucre 10–14 mm long and 4–7 mm wide. Florets yellow, often with pinkish tinge when dry, one and one-half to two times as long as involucre. Achenes light brown, 5.5–7.5 mm long, with 10 weakly raised ribs, at apex attenuate into 1–2 mm long beak; pappus 5.5–7 mm long. Flowering June to October. (Plate XXIV, Fig. 3.)

Sands and gravels along seacoast, and at mouths of more or less large rivers.—*Far East*: Kamchatka, Ussuri, Sakhalin, Kurils. *General distribution*: China, Korean Peninsula, Japan, Vietnam. Described from Far East ("in Sibiria"). Type in London.

GENUS 1664. **Paraixeris** Nakai^{1,2}

Nakai in Bot. Mag. Tokyo XXXIV (1920) 155.—*Ixeris* subgen. *Paraixeris* (Nakai) Stebb. in Journ. Bot. London LXXV (1937) 46.—*Youngia* sect. *Paraixeris* (Nakai) Kitam. in Acta Phytotax. et Geobot. XI (1942) 126.

Capitula usually numerous, borne at apex of stem and its branches, in more or less lax corymbose-panicles, homogamous, with (3)5–18(19) bisexual ligulate florets. Involucre narrowly cylindrical, 5–8 mm long and 2–3 mm wide; outer involucral bracts 2–10, irregularly arranged and variable in form, very small (0.3–1.5 mm long); inner bracts (four) five (six) or (seven) eight(nine), in one row, broadly linear, obtuse, narrowly membranous along margin, with prominent midrib, often at base knob-like thickened at fruiting. Receptacle flat, smooth, irregularly pitted. Flowers ligulate; corolla yellow or orange-yellow, one and one-half to

¹ Treatment by N.N. Tzvelev.

² From the Greek word *para*—near, and the generic name *Ixeris* Cass.; the latter itself is derived from the Indian name of the plant.



two times as long as involucre, with five rather long teeth at apex; corolla tube glabrous or pubescent, 1.5–3 mm long; filaments glabrous; anthers with subobtus triangular apical appendage, basally sagittate; style bifid, almost filiform. Achenes 2.5–3.5 mm long and 0.4–0.8 mm wide, fusiform, slightly flattened dorsally, brownish, with 10–15 prominent, obtuse ribs of variable width covered with rather long spinules or papillae (especially in upper part), gradually attenuate at apex into somewhat thick and lighter-colored, 0.2–1 mm-long beak; pappus of numerous whitish, 2.5–4.5 mm-long hairs, scabrous from very fine spinules, one-rowed, easily falling singly. Annual or biennial glabrous herbs, with erect, more or less uniformly leafy stems and alternate leaves; lamina entire or more or less divided, usually (at least in upper cauline leaves) amplexicaul, or with auricles at base of petioles.

Type of genus: *P. denticulata* (Houtt.) Nakai.

About 8–10 species of this genus are distributed in Southeast Asia from the Amur Basin in the north to Indo-China in the south. Of these, four species are found in the USSR.

Note. On the basis of the achene morphology the species of this genus occupy, as it were, an intermediate position between the genera *Ixeris* Cass. and *Youngia* Cass, but are well distinguished from the former by achenes with less prominent, obtuse (not winged) ribs and a much shorter beak, and from the latter by pappus hairs that easily fall singly and by a distinctive habit resembling species of *Lapsana* L. or *Mycelis* Cass.

1. Inner involucral bracts (four) five (six); middle cauline leaves pinnatisect 4. ***P. saxatilis*** (A. Baran.) Tzvel.
- + Inner involucral bracts (seven) eight (nine); middle cauline leaves entire or pinnatilobate, less often pinnatipartite 2.
2. Cauline leaves entire, more or less toothed to subentire 1. ***P. denticulata*** (Houtt.) Nakai
- + At least middle cauline leaves pinnatilobate or pinnatipartite 3.
3. Involucre usually about 5 mm long; beak of achenes 0.4–0.7 mm long; corolla tube sometimes pubescent, usually more or less glabrous 3. ***P. scrotina*** (Maxim.) Tzvel.
- + Involucre usually 6–7 mm long; beak of achenes 0.2–0.4 mm long; corolla tube usually somewhat densely pubescent 2. ***P. pinnatipartita*** (Makino) Tzvel.

Section 1. Paraixeris.—Capitula with 10–20 florets; inner involucral (seven) eight (nine). achenes spinulose along ribs.

Type of section: type of genus.

The four to six species of this section are closely related ecogeographic races of a single series, and are often considered subspecies of one polytypic species, *P. denticulata* (Houtt.) Nakai sensu lato.

1. ***P. denticulata*** (Houtt.) Nakai in Bot. Mag. Tokyo XXXIV (1920) 156.—*Prenanthes denticulata* Houtt. Natuurl. Hist. X (1779) 385, t. 66, fig. 4.—*P. hastata* Thunb. Fl. Jap. (1784) 301.—*Youngia hastata* (Thunb.) DC. Prodr. VII (1838) 194. —*Y. chrysantha* Maxim. Prim. fl. amur. (1859) 181.—*Lactuca denticulata* (Houtt.) Maxim. in Bull Acad. Sc. Pétersb. XIX (1874) 529, p. p.; Kom. and Alis. Opred. Rast. Dal'nervost. Kr. II (1932) 1098.—*Ixeris denticulata* (Houtt.) Stebb. in Journ. Bot. London LXVV (1937) 46, p. p. —*Youngia denticulata* (Houtt.) Kitam. in Acta Phytotax. et Geobot. XI (1942) 128 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXII, 1 (1955) 124.—**lc.**: Houtt. op. cit.

Biennial or annual. Plants 15–120 cm high, glabrous. Stems erect, uniformly leafy. Basal leaves withering very early; lower and middle cauline leaves numerous, oblong-ovate to lanceolate, 3–10 cm long, sessile, usually more or less amplexicaul, less often narrowed toward base (sometimes even subsessile), usually coarse-toothed, less often entire, short-acuminate, green above, glaucous-green beneath, uppermost leaves reduced, always broadly amplexicaul. Capitula numerous, in paniculate or compound corymbose inflorescence, usually slightly drooping after flowering, on rather long slender peduncles. Involucre 6–8 mm long and 2–3 mm wide; outer involucre bracts three to six, up to 0.8 mm long, inner (seven) eight (nine). Florets 10–17, yellow; corolla tube usually rather densely pubescent. Achenes brownish, 2.5–3.5 mm long and 0.5–0.6 mm wide; with 11–14 ribs in broader part, spinulose mainly in upper part; beak somewhat thick, 0.2–0.4 mm long; pappus 3–4 mm long. Flowering August to October. (Plate XXIV, Fig. 2.)

Deciduous and mixed forests, forest glades, meadows; mainly on stony and rubbly soils, mountain slopes; often also on gravels and sands in river valleys.—*Far East*: Zeya-Bureya, Ussuri. *General distribution*: Mongolia (eastern part), China (eastern part), Korean Peninsula, Japan, Vietnam. Described from Japan. Type in London(?).

Note. A highly polymorphic species. Almost all the cauline leaves of typical specimens are amplexicaul. Though not having an independent range, the form with almost all the leaves narrowed toward the base, possibly constitutes a separate, although very weakly isolated, ecogeographic race.

2. ***P. pinnatipartita*** (Makino) Tzvel. comb. nova.—*Lactuca denticulata* f. *pinnatipartita* Makino in Bot. Mag. Tokyo XIII (1898) 48.—*Youngia denticulata* f. *pinnatipartita* (Makino) Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXII, 1 (1955) 125.

Biennial or annual. Plants 30–120 cm high, glabrous, Stems erect, uniformly leafy. Basal leaves withering very early; lower or middle cauline leaves numerous, oblong-ovate to lanceolate, 3–10 cm long, sessile, amplexicaul, more or less pinnatilobate or pinnatipartite, short-acuminate, green above, glaucous-green beneath; upper leaves usually reduced, undivided, more or less toothed or entire. In other respects resemble the former species. Flowering August to October.

Meadows, forest glades, sands and gravels in river and lake bottomlands, possibly, only as introduced plant.—*Far East*: Ussuri (southern part). *General distribution*: China (eastern part), Korean Peninsula, Japan. Described from Japan. Type in Tokyo.

Note. In leaf form, this species is very similar to *P. serotina*, but is closer to the preceding species in achene morphology and size of the involucre. The absence of *P. serotina* in the southern part of the Pacific Coastal Region (as also in Japan) appears to speak against the possibility of a hybrid origin for *P. pinnatipartita*.

3. *P. serotina* (Maxim.) Tzvel. comb. nova.—*Youngia serotina* Maxim. Prim. fl. amur. (1859) 180.—*Lactuca denticulata* β. *sonchifolia* (Maxim.) Maxim. in Bull. Acad. Sc. Pétersb. XIX (1874) 530, p. p.—*L. sonchifolia* auct. non Debeaux: Kom. and Alis. Opred. Rast. Dal'nevost. Kr. II (1932) 1101.—*Ixeris denticulata* subsp. *sonchifolia* (Maxim.) Stebb. in Journ. Bot. London LXXV (1937) 48, p. p.

Biennial. Plants 25–100 cm high, glabrous, Stems erect, uniformly leafy. Basal leaves withering very early; lower and middle cauline leaves numerous, oblong-ovate to lanceolate, 3–10 cm long, sessile, amplexicaul, more or less pinnatilobate or pinnatipartite, usually with long-acuminate lobes, green above, glaucous-green beneath; upper leaves reduced, undivided, more or less toothed or entire. Capitula numerous, in corymbose-panicles, usually erect after flowering, on rather long (2–10 mm), slender peduncles. Involucre 4.5–5.5 mm long and about 2.5 mm wide; outer involucre bracts 5–10, up to 1.5 mm long, inner bracts (seven) eight (nine). Florets 15–19, yellow, with corolla tube usually sparsely hairy, often more or less glabrous. Achenes brownish, 2.5–3.5 long and about 0.5 mm wide, with 10–14 ribs in broader part covered with spinules; beak somewhat thick, 0.4–0.7 mm long; pappus 3–4 mm long. Flowering July to September.

Meadows and forest glades, scrubs and thin deciduous forests; mainly on stony and rubbly mountain slopes.—*Far East*: Zeya-Bureya, Ussuri(?). *General distribution*: Northeastern China, Korean Peninsula. Described from the Far East (near Blagoveschensk). Type in Leningrad.

Note. This species usually has been united with the very closely related species, *P. sonchifolia* (Maxim.) Tzvel. comb. nova (= *Youngia sonchifolia*

Maxim. *Prim. fl. amur.* (1859) 180.=*Prenanthes sonchifolia* auct. non Willd.: Bunge, *Enum. pl. Chinae bor.* (1832) 40), described by Maximowicz from collections of A. Bunge from the vicinity of Peking [Beijing]. However, the latter species differs from *P. serotina* by having
 400 rosulate basal leaves that persist until flowering time, relatively few cauline leaves, and also a longer (0.6 mm long) achene beak, and it has not been reported so far from the USSR.

Section 2. *Pseudomycelis* Tzvel. sect. nova in Addenda XXVIII, 727.—Capitula usually with five-florets; inner involucre bracts (four) five (six); achenes covered with fairly long papillae along ribs.

Type of section: *P. chelidoniifolia* (Makino) Nakai.

The three species of the section are very close ecogeographic races of one series.

4. ***P. saxatilis*** (A. Baran.) Tzvel. comb. nova.—*Lactuca saxatilis* A. Baran. in Zap. Kharb. Obshch. Estest-vonsp. i E'tnograf. No. 12 (1954) 34, figs. 28–30 and in Fedde, Repert, LVIII, 3 (1960) 289, fig. 1; Kabanov in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XIX (1959) 459.—*L. chelidoniifolia* Kaban. op. cit. (1959) 458 nom. nud. non Makino (1898).—*Ixeris saxatilis* A. Baran. op. cit. (1960) 289, nom. altern.—**lc.**; A. Baran, op. cit. (1960); Kabanov, op. cit. (1953) 462, Fig. 1.

Annual. Plants 10–50 cm high, glabrous. Stems erect, uniformly leafy, simple or somewhat branched almost from base. Basal leaves withering very early; cauline leaves rather numerous, imparipinnatisect, on rather long and slender petioles, with well-developed, acuminate, often more or less toothed auricles at base; leaf segments few (usually two to four on each side), oblong-ovate to oblong-lanceolate, often oblong-rhombic, angular, petiole-like narrowed in lower part, but slightly decurrent at base, acuminate, usually with few (one to three) large teeth along margin, sometimes lobed, green above, glaucous-green beneath; terminal segment usually not larger than lateral. Capitula 3–20, borne at apices of stem and its branches in corymbose-paniculate or racemose inflorescence; drooping after flowering. Involucre 5–6.5 mm long and 2–3 mm wide; outer involucre bracts two to four, up to 0.7 mm long, inner bracts (four) five (six). Florets (three) five (six), yellow or orange-yellow, with glabrous corolla tube. Achenes brownish, 2.5–3.5 mm long and 0.6 mm wide; with 10–15 ribs in broader part (mainly in upper part) covered with rather long papillae; pappus 3.5–4.5 mm long. Flowering August to October.

Stony and rubbly slopes among shrubs and in thin forest (especially in thickets of Erman's birch); in middle and upper mountain zones—*Far East*: Ussuri (so far known only from the Kedrovaya Pad Reserve). *General distribution*: northeastern China, Korean Peninsula (?). Described from northeastern China. Type in Shenyang.

Note. This species is very close to the other two, earlier described species of this section: *P. chelidoniifolia* (Makino) Nakai and *P. koidzumiana* (Kitam) Tzvel. comb. nova (= *Youngia koidzumiana*) Kitam. 401 in Acta Phytotax. et Geobot. XI, 1942, p. 127). Judging from the very thorough study of these two species by Kitamura (1955), *P. saxatilis* differs from the former (*P. chelidoniifolia*), which is widespread in Korea and Japan, by a knob-like thickening at the base of the inner involucre bracts at fruiting time, and from the latter (*P. koidzumiana*), so far known only from the type specimens from Korea, by leaf segments basally narrowed into petioles and slightly smaller involucre. In the USSR, this species was first found by Kobanov (op. cit.).

GENUS 1665. **Lapsana** L.^{1,2}

Capitula small with 8–15 florets in corymbose or paniculate inflorescence; involucre cylindrical-campanulate or campanulate, sometimes cylindrical, two-rowed; outer involucre bracts three to five, small, ovate, inner longer than outer, linear or linear-lanceolate. Receptacle flat, glabrous. Florets yellow, longer than involucre. Achenes cylindrical-cuneate, usually slightly curved, with 20 slender ribs, without beak and pappus, and without scarious border at apex. Annual-perennial herbs, more or less pubescent with simple and glandular hairs, less often glabrous, lower leaves lyrate pinnatifid, upper ones undivided.

Type of genus: *L. communis* L.

1. Plants large (25–100 cm high), bright green, annuals or biennials, less often perennials, involucre cylindrical-campanulate to campanulate 2.
- + Plants small (10–25 cm high), bluish-green, perennials; involucre narrow-cylindrical. Mountainous Crimea 4. **L. aipetriensis** Vass.
2. Involucre 5–7 mm long, 2–4 mm wide 1. **L. communis** L.
- + Involucre larger 3.
3. Annuals or biennials; florets pale yellow; inflorescence lax-paniculate 2. **L. intermedia** M.B.
- + Perennials; florets bright yellow; inflorescence corymbose 3. **L. grandiflora** M.B.

¹ Treatment by I.T. Vassilczenko.

² From Greek word *lapasein*—to purge, from the presumed medicinal property of the plant.

1. **L. communis** L. Sp. pl. (1753) 811; M.B. Fl. taur.-cauc. II (1808) 261; Ldb. Fl. Ross. II, 2, 770; DC. Prodr. VII, 76; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 352; Grossh. Fl. Kavk. IV, 223; Kraschen. in Fl. Yugo-Vost. VI (1936) 437; Krylov, Fl. Zap. Sib. XI, 2907; Klovov in
 402 Vozn. Rosl. URSS (1950) 583.— *L. glandulosa* (Frey) Klok. Ibid.—*L. sonchifolia* Gilib. Fl. Lithuan. (1781) 243.— **Exs.:** GRF No. 673; Pl. Finl. exs. No. 394.

Annual. Stem erect, divaricately branched, less often simple, with (mostly in lower part) spreading, somewhat stiff hairs, usually more or less mixed with glandular hairs, to densely glandular pubescent (f. *glandulosa* Freyn), sometimes subglabrous, 20–100 cm high. Leaves thin, unevenly crenate- or sinuate-toothed, on both surfaces or only beneath and along margin scatteredly hairy; lower leaves petiolate, 3–10 cm long and 1.5–6.0 cm wide, lyrate pinnatisect, with large ovate, terminal lobes and one or two pairs of small, ovate or lanceolate, lateral lobes; upper leaves sessile, oblong-lanceolate or ovate-rhombic, smaller. Capitula numerous, in paniculate inflorescence, small; involucre about 2–4 mm wide, 5–7 mm long; involucre bracts usually smooth, less often more or less hairy; outer bracts small, inconspicuous, scarious, inner ones five to seven times as long as outer, linear-lanceolate, on outer side with thickened ribs, often darkish at apex. Corolla pale yellow, one and one-half times as long as involucre. Achenes linear-cuneate, slightly curved and lustrous, fine-ribbed, gradually narrowed toward base, glabrous, 3.5–4 mm long. Flowering June to July.

Edges and open forests, clearings; usually found as weed in fields, orchards and gardens; in the more southern regions only in places with more moisture.—*European Part:* All regions; *Caucasus:* Ciscaucasia; *Western Siberia:* Upper Tobol, Irtysh, Altai; *Eastern Siberia:* Angara-Sayans; *Soviet Central Asia:* Tien Shan. *General distribution:* central and Atlantic Europe, Mediterranean area, Balkans-Asia Minor, Iran; introduced in North America. Described from western Europe. Type in London.

Note. The Herbarium of the Botanical Institute of the Academy of Sciences of the USSR has only one specimen of this species from Soviet Central Asia, collected in Frunze, near an "aryk,"* 7. IX. 1916, Yu. and G. Zinserling.

2. **L. intermedia** M.B. Fl. taur.-cauc. II (1819) 540; DC. Prodr. VII, 76; Ldb. Fl. Ross. II, 2, 771; Boiss. Fl. or. III, 720.— *L. grandiflora* M.B. var. *intermedia* Schmalh. Fl. II (1897) 133.—**Exs.:** GRF No. 1028.

Annuals or biennials. Stem 25–75(100) cm high, branched in upper half, with simple and glandular hairs to subglabrous. Lower leaves long-

* Aryk—an irrigation canal—General Editor

petiolate, lyrate pinnatisect or divided with large, usually ovate, terminal lobe and smaller lateral lobes; upper (middle and upper) cauline leaves simple, lanceolate or oblong-lanceolate, sometimes more or less ovate, sinuate-toothed, short-petiolate or sessile. Inflorescence paniculate, with more or less numerous capitula; involucre 7–9 mm long, involucre bracts green or only slightly glaucescent, usually glabrous. Corolla pale yellow (dirty yellow to dirty white when dry), one and one-half to two times as
 403 long as involucre. Achenes narrow-cuneate, whitish-reddish-brown, 3–3.5 mm long, often weakly curved. Flowering May to September.

Forest glades and edges, foothill meadow-steppes, as well as in gardens, parks, vegetable gardens, sometimes in fields, foothills and lower forest zone up to 1,500–1,800 (1,900) m. *European Part*: Crimea; *Caucasus*: all regions. *General distribution*: Balkans-Asia Minor. Described from Crimea and Caucasus. Type in Leningrad.

Note. The species *L. adenophora* Boiss. *Diagn. pl. or. ser. I*, 4 (1844) 23, described from Asia Minor, according to Boissier differs from *L. intermedia* M.B. by a more intensive glandular pubescence and long-paniculate inflorescence. I think these are insufficient characters for separating the two species—a fact, apparently, doubted by Boissier himself (l. c.). Without resolving the question of the relationship of *L. adenophora* to *L. intermedia*, for lack of sufficient material from Asia Minor, all the same, I refrain from reporting the former species (as an independent species) for the Caucasus.

3. ***L. grandiflora*** M.B. Fl. taur.-cauc. II (1808) 261 and III (1819) 540; DC. Prodr. VII, 1, 77; Ldb. Fl. Ross. II, 2, 771; Boiss. Fl. or. III, 720; Grossh. Fl. Kavk. IV (1934) 225.

Perennial. Stem 20–75(100) cm high, simple or branched, only at apex usually with short, simple or simple and glandular hairs; simple hairs often predominating in lower part of the stem, glandular ones in the upper part; sometimes stem subglabrous. Lower leaves lyrate pinnatisect, with small, lanceolate or ovate, lateral segments and terminal larger, ovate or oblong-ovate, sometimes triangular-hastate lobe, long-petiolate; in upper part of the stem leaves elongate, lanceolate to linear-lanceolate and rhombic-lanceolate, sessile; all leaves except uppermost, more or less sinuate or crenate-toothed, fine-hairy or subglabrous. Inflorescence corymbose-paniculate or corymbose; outer involucre bracts small, broadly ovate; inner much larger, linear-lanceolate, 8–10 mm long, usually with simple or fine glandular hairs, at least along midrib, sometimes glabrous, dark (blackish-green). Corolla bright yellow, two to two and one-half times as long as involucre; capitula large, on long peduncles with glandular hairs or only sparsely hairy (to glabrous). Achenes linear-cuneate, light reddish-brown, about 3.5–4.5 mm long. Flowering June to September.

Forest glades and edges in upper forest zone and subalpine meadows, from (1,500) 1,800 to 2,500 (2,650) m.—*Caucasus*: all regions. *General distribution*: Balkans-Asia Minor. Described from Central Caucasus (Koishaury, along the Georgian Military Road). Type in Leningrad.

Note. Among the characters differentiating this species from *L. intermedia*, Grossheim (l. c.) cites the glandular pubescence of the involucre bracts for *L. grandiflora*. However, according to his own data, the involucre of *L. intermedia* is glabrous or with isolated glands. Nevertheless, sometimes even the same plant has some peduncles (and
404 involucre) that are densely glandular while others are weakly pubescent or even glabrous. In view of the strong variation of this character in both species, I preferred to refrain from using it for diagnostic purposes. Equally unsatisfactory is the attempt to establish any varieties of the species in question (just as in other species of this genus), based on the degree of lobing of the leaves, etc., for example, *L. grandiflora* var. *pinnatisecta* Somm. and Lev. All of the quite large intraspecific variation of the species of this genus requires in-depth study. At present, adequate material is not available.

4. *L. aipetriensis* Vass. sp. in Addenda XXVIII, 727.

Perennials. Plant glaucous-green with numerous low, 10–25 cm high stems. Lower leaves lyrate pinnatisect with triangular, sinuate-toothed terminal lobe and small, ovate, fine-hairy, lateral lobes (hairs both simple and glandular); upper cauline leaves sessile, lanceolate. Capitula in paniculate inflorescence, cylindrical, 7–9 mm long, 2–3 mm wide, on thick, more or less glabrous peduncles; outer involucre bracts small, ovate, inner bracts larger, linear, glaucescent, glabrous or with one row of hairs on outer side. Florets pale yellow (dirty creamish when dry), one and one-half to two times as long as involucre. Achenes light colored, slightly reddish-brown, 3–4 mm long. Flowering July to September.

Mountain slopes near Ai-Petri Peak.—*European Part*: Crimea. Endemic. Described from vicinity of Yalta. Type in Leningrad.

GENUS 1666. *Aposeris* Neck.^{1,2}

Neck. Elem. I (1790) 57

Capitula solitary, terminal; involucre two-rowed; inner bracts three to four times as long as outer. Receptacle glabrous. Corolla golden-yellow,

¹ Treatment by L.T. Vassilczenko.

² From the Greek words *a*—not, and *seris*—salad; a useless, inedible salad (the plant contains a malodorous latex).

two times as long as involucre. Achenes 4–5 mm long, oblong-ovate, flattened, indistinctly four- or five-angled, with very fine, dense hairs, pappus and beak absent. Perennial herbs with short leafless stems (scapes) and rosettes of pectinately pinnatipartite leaves.

A monotypic genus.

1. **A. foetida** (L.) Less. Synops. compos. (1982) 128; DC. Prodr. VII, 81; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 357; Hegi, Ill. Fl. VI, 2 (1929) 1002; Klokov in Vozn. Rosl. USSR (1950) 584.—*Hyoseris* 405 *foetida* L. Sp. pl. (1753) 808.—*Lampsana foetida* Scop. Fl. Carn. II (1772) 118.—**lc.**: Hegi, op. cit. fig. 690–692; Rchb. Ic. Fl. Germ. XIX (1858) t. 1354.

Annuals. Stem 5–25 cm high, solitary or few, simple, glabrous. Leaves in basal rosette oblong-obovate, glabrous or more or less hairy along petiole and beneath along midrib, lobes 5–10 pairs, trapezoidal and unevenly sparsely toothed, perpendicular to petiole or even slightly deflexed, gradually decreasing below; terminal lobe largest, hastate-trilobate. Inner involucre bracts oblong-lanceolate, 1–12 mm long; outer bracts narrowly lanceolate, small. Ligules 15–20 mm long. Achenes persisting in capitula, with slightly hardened inner involucre bracts, light reddish-brown, more or less flattened (usually plano-convex or convex-concave) with inconspicuous ribs with inconspicuous annular border (thickening) at apex. Flowering June to August. (Plate 1, Fig. 2.)

In open forests and among shrubs, forest-meadows and near riverbanks (in Carpathians, in beech-spruce, beech and other forests).—*European Part*: Upper Dniester, Upper Dnieper (southwestern area). *General distribution*: central Europe (mostly in Alps and Carpathian Mountains). Described from northern Italy. Type in London.

GENUS 1667. **Taraxacum** Wigg.^{1,2}

Wigg. primit. Fl. Holsat. (1780) 56, nom. conser.; Hand.-Mazz. Monogr. Tarax. (1907) 1.

Capitula homogamous, with numerous bisexual ligulate florets, solitary terminal on leafless fistular stems—scapes, very rarely (in *T. montanum*) scapes more or less branched, with several capitula. Involucre 7–25 mm long, campanulate or wide cylindrical; outer involucre bracts in a few

¹ Treatment by B.K. Schischkin; the unfinished manuscript was made ready for the press by N.N. Tzvelev.

² Latin transcription of the Arabic name of the plant—*tharakhachakon*—belonging either to a species of chicory (*Cichorium* L.) or to one of the composites with yellow florets (possibly, a species of the genus *Sonchus* L.).

(usually two or three) irregular rows and shorter than inner, usually gradually longer from outermost to more inner, from broadly ovate to lanceolate-linear, herbaceous or membranous, appressed to inner involucre bracts or more or less deflected, often deflexed; inner involucre bracts always erect at anthesis, oblong-linear, herbaceous, equal or almost equal in length and arranged in one row; often with more or less long fistular appendages—"cornicles"—usually one on each involucre bract subterminally. Receptacle flat, glabrous, locular. Florets usually one and one-half to two and one-half times as long as involucre, yellow of different shades, less often whitish, pink or reddish, corolla glabrous or more or less hairy in middle, lingules with five obtuse teeth at apex. Anthers short-sagittate at base, their apical appendage obtuse-triangular. Style branches slender. Achenes all alike, their body 2–6 mm long, fusiform-cylindrical, longitudinally sulcate, usually covered with more or less long, acute tubercles in middle part of almost over entire surface, tubercles gradually longer toward apex, some of them often partly merged in transverse ridges or scarious processes, less often entirely glabrous, with few longitudinal furrows, gradually or abruptly terminated at apex into short, much narrowed part of achene—a small cone, in turn terminated into more or less long (often many times as long as body of the achene), less often very short beak, latter sometimes almost totally absent, usually separated from cone by inconspicuous articulation; pappus of numerous, 3–9 mm-long bristles, scabrous from spinules, arranged in few, approximate, irregular rows, white, less often with weak brownish or lilac tinge. Perennial plants containing latex in all parts, glabrous or more or less covered with lax arachnoid tomentum and crisped hairs, with simple or branched, usually virgate roots on which accessory buds develop readily; leaves clustered in basal rosette, smooth, more or less toothed (less often entire) to pinnatipartite, gradually narrowed at base into more or less long winged petiole.

Type of genus: *T. officinale* Wigg.

The genus has numerous (over 1,000) species. Most of them have lost the capacity for normal pollination, are apomictic, widely distributed in cold, temperate and subtropical countries in both hemispheres, but are particularly numerous in the mountainous regions of Eurasia. The present treatment, which includes 203 species of the genus, is far from exhaustive for *Taraxacum* species found on the territory of the USSR. These species can be identified only from considerably more abundant and better collected material. This is just the initial treatment, which may be used as the basis for a deeper understanding of the genus. This treatment, in particular, does not include the numerous species—the apomicts of the *T. officinale* Wigg. s. l. complex—which, despite the presence of minor but adequately persistent morphological differences, are difficult to identify

in the absence of reliable material for comparison. The genus, as a whole, is very natural and completely distinct but divisible into infrageneric taxa with difficulty.

Economic Importance. Some species of the genus (particularly *T. officinale* Wigg.) are common weeds, sometimes growing abundantly in gardens and parks, on lawns, in seeded meadows and different crop plantations. Two species of the genus (Kok-Sagyz—*T. kok-saghyz* Rodin and Krym-sagyz—*T. hybernum* Stev.) yield latex and earlier were extensively cultivated for industrial purposes. Leaves of *T. officinale* Wigg. may be used as salad.

Note. The identification of dandelions is a very difficult task in view of their relatively similar appearance habit. For the precise identification of species, in a majority of cases fully mature achenes must be available, which is especially important in ascertaining the relative sizes of the enlarged body of the achene and of the beak that attains its full length at this time. Also of great importance is the color of the florets in the living state, which changes considerably on drying.

1. Florets pink, light purple, lilac-pink or reddish 2.
- + Florets yellow, light yellow or whitish; peripheral florets on lower side of lingules often with darker (brownish, lilac, grayish, less often pinkish) stripe 5.
2. Plants 1.5–4.0 cm high, leaves 1.5–4.0 cm long; scapes with dense arachnoid tomentum below capitulum; beak of achenes 1–3 mm long. Pamir 186. **T. rubidum** Schischk.
- + Plants 6–25 cm high; leaves 4–15 cm long; scape glabrous, less often with few flexuous hairs below capitulum; beak 3–8 mm long 3.
- 3 Body of achene 3.5–4.0 mm long; involucre bracts, at least partly, with more or less cornicles. Caucasus 156. **T. poryphyranthum** Boiss.
- + Body of achene about 3 mm long; involucre bracts without cornicles. Soviet Central Asia 4.
- 4 Involucre 14–20 mm long, green; beak of fully mature achenes 6–8 mm long 157 **T. pseudoroseum** Schischk.
- + Involucre 9–14 mm long, dark green; beak 3–4 mm long 158. **T. lilacium** Krassn. ex Schischk.
5. Leaves 5–30 cm long and 1.5–6.0 cm wide, coriaceous-herbaceous, grayish-green, covered with usually rather profuse pubescence of crisped or longer flexuous hairs on both surfaces, undivided, sinuate-toothed to pinnatipartite with irregularly toothed lobes; scapes covered with lax arachnoid tomentum entirely or over almost entire length, more densely below capitulum; pappus 7–1

- mm long 6.
- + Leaves herbaceous, green, glabrous or subglabrous, less often rather profusely arachnoid pubescent and then pinnatipartite, with entire or subentire lobes; scapes usually lax arachnoid tomentum only below capitulum, otherwise glabrous or scatteredly hairy, sometimes entirely glabrous 8.
- 408 6. Body of achene 4.5–5.5 mm long; beak 5–8 mm long; pappus 7–8 mm long 3. **T. serotinum** (Waldst. and Kit.) Poir.
- + Body of achene 5–7 mm long; beak 7–15 mm long; pappus 7–10 mm long; stem often with scale-like apical leaves 7.
7. Scapes usually branched, with one to three lateral branches, less often simple; body of achene 5–6 mm long; cone 1.5–2.5 mm long. Transcaucasia 1. **T. montanum** (C.A.M.) DC.
- + Scapes simple; body of achene 5–7 mm long; cone 1.0–1.5 mm long 2. **T. syriacum** Boiss.
8. Mature achenes reddish-brown or reddish 9.
- + Mature achenes light brown, yellowish-brown, brownish or dark brown 21.
9. Involucre dark green, often blackish. Plants of Arctic Siberia and Far East 10.
- + Involucre green or glaucescent-green. Plants not found in Arctic Siberia and Far East 12.
10. All involucre bracts without cornicles 120. **T. rubiginans** Dahlst.
- + At least some outer involucre bracts with cornicles 11.
11. Outer involucre bracts with rather wide, scarious border 121. **T. rufum** Dahlst.
- + Outer involucre bracts almost without scarious border 122. **T. lateritium** Dahlst.
12. Beak of fully mature achenes 4.5–6.5 mm long. Mountainous plants 13.
- + Beak usually 7–12 mm long, less often 5–7 mm long, but then plants found in plains 15.
13. Body of achenes 2.5–3.0 mm long. Transcaucasia 115. **T. armeniacum** Schischk.
- + Body of achenes 3.5–4.0 mm long 14.
14. Pappus about 5 mm long. Altai ... 119. **T. sumnevicii** Schischk.
- + Pappus 6–7 mm long. Western Tien Shan 117. **T. repandum** Pavl.
15. Pappus 7.5–8.0 mm long. Crimea 112. **T. tauricum** Kotov
- + Pappus 4–7 mm long 16.
16. Pappus 4–5 mm long. Alpine plants of western Tien Shan 118. **T. tianschanicum** Pavl.

- + Pappus 5–7 mm long. Plants of lowlands and lower mountain zone 17.
17. Inner involucre bracts without cornicles or with inconspicuous cornicles 18.
- 409 + All or almost all inner involucre bracts with more or less large subterminal cornicles 19.
18. Body of achene covered with acute tubercles almost from base, beak 8–10 mm long, Turkmenia 116. **T. androssovii** Schischk.
- + Body of achene with acute tubercles only in upper half; beak 9–12 mm long, Baltic Region 113. **T. intercedens** Markl.
19. All or almost all outer involucre bracts with rather long cornicles. Transcaucasia 114. **T. praticola** Schischk.
- + All or almost all outer involucre bracts with very short cornicles 20.
20. Plants of pine forest sands; cone of achenes 0.8–1.2 mm long... 111. **T. pineticola** Klok.
- + Plants of more or less wet, often alkaline meadows; cone 0.5–0.8 mm long 11. **T. erythrospermum** Andr.
21. Root collar in axils of living and dead leaves with more or less profuse brown tomentum of long flexuous hairs. Plants of more southern regions of the USSR 22.
- + Root collar glabrous, less often subglabrous; with fewer flexuous hairs in leaf axils 54.
22. Leaves 2–8 cm long, covered with rather profuse arachnoid-hairy pubescence on both sides mostly along midrib, deeply pinnatifid, with rather numerous, usually entire, lateral lobes; scapes usually also arachnoid-pubescent over almost entire length 23.
- + Leaves glabrous or with less conscious pubescence of scattered hairs 25.
23. All or most involucre bracts with preapical small, dark colored subterminal cornicles. Soviet Central Asia 184. **T. minutilobum** M. Pop. ex S. Koval.
- + Involucre bracts without cornicles or with inconspicuous cornicles 24.
24. Leaves 2–3 cm long and 3–6 mm wide. Baikal Region 171. **T. baicalense** Schischk.
- + leaves 2–8 cm long and 7–2 cm wide. Caucasus 202 **T. tenuisectum** Somm. and Lev.
25. Plants of southern Crimea with very thick, usually many-headed root, usually flowering in August–December (sometimes also in

- spring), at anthesis often with relatively weakly developed (partly dead) leaves 26.
- + Plants absent in Crimea, always with well-developed leaves at anthesis, flowering usually in summer, less often in August–September, but then usually alpine plants 27.
- 410 26. Beak of fully mature achenes 7–8 mm long 160. **T. pobedimoviae** Schischk.
- + Beak of achenes 4.6–5.0 mm long 159. **T. hybernium** Stev.
27. Scapes entirely glabrous or with fewer flexuous hairs below capitula 28.
- + Scapes always with more or less profuse lax arachnoid tomentum below capitula, below glabrous or with scattered hairs 34.
28. Leaves 1.5–5.0 cm long 29.
- + Leaves (4)5–20(25) cm long 30.
29. Beak of mature achenes 6–7 mm long. Transcaucasia 98. **T. neo-lobulatum** Van Soest.
- + Beak of achenes 3–4 mm long. Karatau Range 181. **T. glabellum** Schischk.
30. Body of achenes 2.5–2.8 mm long 31.
- + Body of achenes 3.5–6.0 mm long 32.
31. Cone of achenes about 0.6 mm long; leaves 10–25 cm long, undivided, more or less toothed to pinnatilobate, Karatau Range 96. **T. karatavicum** Pavl.
- + Cone of achenes 0.8–1.0 mm long; leaves 10–20 cm long, undivided, more or less toothed. Gissar Range 95. **T. tadshicorum** Ovcz.
32. Body of achenes 5–6 mm long; pappus 6–7 mm long. Transcaucasia 200. **T. pseudonigricans** Hand.-Mazz.
- + Body of achenes 3.5–6.0 mm long; pappus 7–8 mm long 33.
33. Plants of upper mountain zone of Gissar Range; body of achenes 3.5–4.0 mm long 74. **T. glaucivirens** Schischk.
- + Plants of lowlands and foothills of southern Siberia and Soviet Central Asia; body of achenes 4–5 mm long 73. **T. glaucanthum** (Ldb.) DC.
34. Body of achenes 2.3–5.0 cm long 35.
- + Body of achenes 4–5 mm long 43.
35. Outer involucre bracts strongly deflexed from inner already at beginning of anthesis, later recurved, longest of them one-third to two-fifths as long as inner bracts; beak of achenes 6–8 mm long. Soviet Central Asia 34.

- + Outer involucrel bracts more or less appressed to inner bracts during anthesis and at fruiting; longest of them half as long as inner bracts 38.
- 36. Body of achenes 3–3.5 mm long 91. **T. muratavicum** Schischk.
- + Body of achenes 2–2.6 mm long 37.
- 411 37. Leaves 4–12 cm long and 1–2.5 cm wide; involucre 10–14 mm long; body of achenes with relatively fewer acute tubercles in upper third 81. **T. botschanzevii** Schischk.
- + Leaves 5–10 cm long, and 0.5–1.0 cm wide; involucre 8–11 mm long; body of achenes with numerous acute tubercles in upper half 85. **T. comitans** S. Koval.
- 38. Leaves usually of same rosettes undivided, more or less toothed to pinnatilobate or partly pinnatipartite. Pamir and Alai 39.
- + Leaves pinnatipartite or pinnatilobate. Southern Siberia 4.
- 39. Leaves 8–16 cm long; beak of achenes 6–8 mm long 124. **T. ikonnikovii** Schischk.
- + Leaves 2.5–6.0 cm long; beak of achenes 1.5–2.5 mm long 198. **T. oschense** Schischk.
- 40. Body of achenes with relatively fewer acute tubercles only in upper third; leaves 5–20 cm long 173. **T. dealbatum** Hand.-Mazz.
- + Body of achenes with numerous acute tubercles in upper half ... 41.
- 41. Body of achenes with acute tubercles almost from base; pappus 6–7 mm long; leaves 6–20 cm long and 1–4 cm wide 174. **T. czuense** Schischk.
- + Body of achenes with acute tubercles only in upper half; pappus 4–5 mm long; leaves 2–8 cm long and 5–12 mm wide 42.
- 42. Terminal lobe of leaves usually not larger than lateral lobes; cone of achenes about 0.8 mm long 169. **T. dissectum** (Ldb.) Ldb.
- + Terminal lobe of leaves usually considerably larger than lateral lobes; cone of achenes 0.3–4.0 mm long 170. **T. collinum** DC.
- 43. Beak of fully mature achenes 0.8–1.5 mm long; Zeravshan Range 185. **T. erostre** Zak.
- + Beak always more than 2.5 mm long 44.
- 44. Body of achenes almost smooth, with few very short, acute or obtuse tubercles only in upper part, very gradually and imperceptibly terminated in cone 45.
- + Body of achenes always with numerous, fairly long, acute tubercles in upper part, usually well separated from cone 48.

45. Pappus 4–5 mm long, leaves 2–5 cm long, glabrous, usually undivided, more or less toothed, less often partly entire or pinnatilobate. Pamirs 199. **T. pamiricum** Schischk.
- 412 + Pappus about 6 mm long; leaves usually scatteredly short-hairy. Caucasus 46.
46. Beak 4.5–7.0 long 166. **T. voronovii** Schischk.
- + Beak 2.5–4.0 mm long 47.
47. Outer involucre bracts more or less deflected from inner bracts 164. **T. daralgesicum** Schischk.
- + Outer involucre bracts more or less appressed to inner bracts 163. **T. oliganthum** Schott. and Kotschy ex Hand.-Mazz.
48. All involucre bracts without cornicle or with indistinct cornicles. Kopetdag 197. **T. muricatum** Schischk.
- + At least some involucre bracts with small but distinct subterminal cornicles 49.
49. Plants of alkaline meadows of Ciscaucasia; leaves 2–6 cm long, pinnatipartite 161. **T. ciscaucasicum** Schischk.
- + Plants of Soviet Central Asia and Sayan Mountains 50.
50. Outer involucre bracts with wide, scarious border, flowering in May, plants of lowlands and foothills 192. **T. eriobasis** S. Koval.
- + Outer involucre bracts with narrow, scarious border or border entirely absent; flowering in summer, plants of middle and upper mountain zone 51.
51. Outer involucre bracts with narrow but distinct scarious border 52.
- + Outer involucre bracts almost without scarious border 53.
52. Leaves grayish-green, outer leaves in rosette usually undivided, others pinnatilobate to pinnatipartite, with small terminal lobes, beak of achenes 5–6 mm long 196. **T. luridum** (Hagl.)
- + Leaves green, all runcinately pinnatipartite with larger terminal lobe; beak 4–5 mm long 168. **T. varsobicum** Schischk.
53. Beak of fully mature achenes about 6 mm long; involucre dark green 138. **T. eriopodium** (D. Don) DC.
- + Beak 2.5–4.5 mm long; involucre green or grayish-green 167. **T. fedtschenkoi** Hand.-Mazz.
- 54(21) All involucre bracts without cornicle or with indistinct cornicle 55.
- + All involucre bracts or only some (often only inner or only outer) with more or less large, often short and obtuse but always well-developed subterminal cornicle 125.
55. Outer involucre bracts strongly deflected sideward (from inner bracts) to deflexed already at flowering time 56.

- 413 + Outer involucre bracts more or less appressed to inner bracts at least at flowering time and at the very beginning of fruiting 70.
56. Outer involucre bracts more or less elongated, longest of them usually only two-thirds or more as long as inner bracts; corolla usually (except *T. macrolepium*) profusely long-hairy in the middle 57.
- + Outer involucre bracts shorter, longest of them usually half or less as long as inner bracts; corolla usually short hairy or glabrous in the middle, less often with small mixture of long hairs 63.
57. Corolla with scattered short hairs in the middle only with occasional, long flexuous hairs. Transcaucasia 11. **T. macrolepium** Schischk.
- + Corolla with rather numerous flexuous hairs in the middle 58.
58. Outer involucre bracts ovate to broadly lanceolate, very large, considerably wider than inner bracts, membranous, light green. Kamchatka 14. **T. platycranum** Dahlst.
- + Outer involucre bracts on the average less large, usually only slightly wider than inner bracts, or as wide. Plants absent in Kamchatka 59.
59. Body of achenes with few, short, acute tubercles only in upper third, merging into transverse ridge, rather gradually terminating in cone; capitula very large, involucre 15–22 mm long. Baltic Region 13. **T. praestans** Lindb. f.
- + Body of achenes with numerous, acute tubercles in upper half, well separated from cone 60.
60. Outer involucre bracts on the average narrower, broadly lanceolate to lanceolate on lanceolate-linear, usually almost not wider than inner bracts 61.
- + Outer involucre bracts on the average wider, lanceolate ovate to broadly lanceolate, usually distinctly wider than inner bracts 62.
61. Outer involucre bracts usually almost horizontal. Soviet Central Asia 6. **T. complicatum** S. Koval.
- + Outer involucre bracts usually deflexed. Widely distributed species 4. **T. officinale** Wigg.
62. Cone of achene about 0.5 mm long. Soviet Central Asia 5. **T. almatense** Schischk.
- + Cone of achenes 0.6–0.8 mm long. Transcaucasia 10. **T. grossheimii** Schischk.
- 414 63. Body of achenes 3.5–4.5 mm long, smooth or almost smooth (with few inconspicuous tubercles in the upper part), very gradually terminated in cone; involucre dark green, usually more or less

- blackish; scapes glabrous, less often subglabrous. Plants of the Arctic and mountainous regions of Siberia 64.
- + Body of achenes always with rather numerous, acute tubercles in upper part, well separated from cone 66.
64. Outer involucre bracts ovate to broadly lanceolate. Kola Peninsula 148. **T. nivale** Lge. ex Kihlm.
- + Outer involucre bracts narrower, lanceolate-ovate or broadly lanceolate to lanceolate 65.
65. Mature achenes dark brown 149. **T. tundricola** Hand.-Mazz.
- + Mature achenes light brown 150. **T. glabrum** DC.
66. Involucre dark green, more or less blackish. Carpathians 151. **T. nigricans** (Kit.) Rchb.
- + Involucre green. Soviet Central Asia 67.
67. Pappus about 7 mm long; cone of achenes 1.2–1.8 mm long 97. **T. longipyramidatum** Schischk.
- + Pappus 5–6 mm long 68.
68. Body of achenes 2.3–3.0 mm long; inner involucre bracts two and one-half to three times as long as longest outer bracts 82. **T. multiscaposum** Schischk.
- + Body of achene about 3.5 mm long; inner involucre bracts usually two times as long as longest outer bracts 69.
69. Cone of achenes 1.5–2.0 mm long; beak about 7 mm long 102. **T. pseudo-dissimile** Van Soest.
- + Cone of achenes about 1 mm long; beak 8–11 mm long 103. **T. longirostre** Schischk.
- 70(55) Plants of the Arctic and Far East 71.
- + Plants absent in the Arctic and Far East 88.
71. Scapes below capitula always with more or less profuse lax arachnoid tomentum. Plants of Far East 72.
- + Scapes below capitula only with few flexuous hairs or entirely glabrous 78.
72. Leaves undivided, sinuate-toothed, less often in same rosettes partly pinnatilobate 73.
- + All leaves pinnatipartite or pinnatilobate 74.
73. Outer involucre bracts with scarious border. Sakhalin 24. **T. tatewakii** Kitam.
- + Outer involucre bracts almost without scarious border. Kamchatka 21. **T. natschikense** Kom.
- 415 74. Outer involucre bracts broadly lanceolate to lanceolate, longest of them usually two-thirds as long as inner 21. **T. mexicanum** DC.
- + Outer involucre bracts usually wider, longest of them half to two-fifths as long as inner 75.

75. Leaves 2–5 cm long and 6–12 mm wide. Kamchatka 190. **T. albescens** Dahlst.
 + Leaves 9–30(40) cm long and 1.5–7.0 cm wide 76.
76. Outer involucre bracts more or less oblong, whitish. Sakhalin ..
 23. **T. neo-sachalinense** Koidz.
 + Outer involucre bracts wider, ovate and broadly ovate, to broadly lanceolate, green 77.
77. Terminal lobe of leaves small; outer involucre bracts ovate to broadly lanceolate 18. **T. platyepidum** Diels.
 + Terminal lobe of leaves larger than laterals; outer involucre bracts broadly ovate to lanceolate-ovate 19. **T. ohwianum** Kitam.
78. Body of achenes with few, very short, acute tubercles in the upper part, sometimes almost smooth, very gradually and imperceptibly terminated in cone; in involucre dark green, often almost blackish 79.
 + Body of achenes with numerous acute tubercles in the upper third or half, usually (except in *T. pseudoglabrum* well separated from cone at the apex 82.
79. Beak about 10 mm long. Kamchatka
 26. **T. pseudoglabrum** Dahlst.
 + Beak 3–7 mm long 80.
80. Beak of fully mature achenes 5–7 mm long; body of achenes almost smooth; leaves with obtuse or subobtuse lateral lobes. Far East 155. **T. kamtschaticum** Dahlst.
 + Beak of fully mature achenes 3–5 mm long, body of achenes usually with few but distinct acute tubercles in the upper part. Arctic 81.
81. Beak of fully mature achenes 4.5–5.0 mm long; involucre 12–13 mm long. Eastern regions of the Arctic
 154. **T. sibiricum** Dahlst.
 + Beak of fully mature achenes 4.0–4.5 mm long; involucre 9–12 mm long. Western regions of the Arctic
 153. **T. arcticum** (Trautv.) Dahlst.
82. Involucre dark green, often almost blackish. Arctic 83.
 + Involucre green 86.
83. Cone of achenes 0.6–1.0 mm long; beak 6–10 mm long; pappus about 7 mm long 84.
 + Cone of achenes about 0.5 mm long; beak 3–7 mm long; pappus 5–6 mm long. Novaya Zemlya 85.
- 416 84. Body of achenes 4.0–4.5 mm long; with relatively fewer acute tubercles only in the upper third
 31. **T. lapponicum** Kihlm. ex Hand.-Mazz.
 + Body of achenes about 3.7 mm long, with rather numerous acute

- tubercles in the upper half 70. **T. brachyceras** Dahlst.
85. Body of achenes about 4.5 mm long; beak 3–5 mm long; all leaves undivided, with few broad and short teeth 145. **T. platylepium** Dahlst.
- + Body of achenes 3.5–4.0 mm long, beak 5–7 mm long; leaves usually in the same rosettes undivided, sinuate-toothed to pinnatilobate 146. **T. lyngeanum** Hagl.
86. Outer involucre bracts with narrow scarious border; outer leaves of rosette usually undivided, more or less toothed. Pacific Coastal Region 22. **T. ussuriense** Kom.
- + Outer involucre bracts almost without scarious border; all leaves of rosette runcinately pinnatipartite or pinnatilobate. Western region of the Arctic 87.
87. Petiole and midrib more or less pinkish or pinkish-violet; capitula larger 31. **T. sagittifolium** Lindb. f. ex Dahlst.
- + Petiole and midrib green; capitula medium 29. **T. croceum** Dahlst.
- 88(70) Beak of fully mature achenes shorter than 6 mm 89.
- + Beak of fully mature achenes longer than 6 mm 102.
89. Widely distributed plants of lowlands and foothills, flowering in August–September; outer involucre bracts rather narrow, lanceolate to lanceolate-linear, often narrower than inner bracts 162. **T. bessarabicum** (Hornem.) Hand.-Mazz.
- + Plants of middle and upper mountain zones, flowering in summer; outer involucre bracts on the average wider, ovate and broadly lanceolate to lanceolate 90.
90. Florets whitish; leaves undivided and entire (often narrowly linear) to pinnatilobate. Widely distributed plant 172. **T. leucanthum** (Ldb.) Ldb.
- + Florets yellow or light yellow 91.
91. Mountainous plants of Baikal Region 175. **T. sinicum** Kitag.
- + Plants absent in Baikal Region 92.
92. Body of achenes 3.5–5.0 mm long; with very short and mutually coalescing, acute tubercles in the upper third, very gradually terminated in short cone, in turn imperceptibly terminated in beak; leaves undivided, entire or with remote short teeth. Plants of Caucasus 176. **T. crepidiforme** DC.
- + Beak of achenes distinctly separated from cone 93.
93. Body of achenes 5.0–5.5 mm long. Eastern Tien Shan 191. **T. calcareum** V. Korol.
- + Body of achenes 2.5–4.5 mm long 94.
94. Scapes entirely glabrous, less often with a few hairs below capitula 95.

- + Scapes below capitula with more or less profuse arachnoid-hairy tomentum 98.
- 95. Alpine plants of the Carpathians 17. **T. alpinum** Hegetschw. and Heer
- + Alpine plants of Soviet Central Asia 96.
- 96. Body of achenes covered with acute tubercles in the upper half; inner involucre bracts usually one and one-half times as long as the longest outer bracts; leaves undivided, with distant short teeth 139. **T. rubtzovii** Schischk.
- + Body of achenes with a few, short, acute or obtuse, tubercles in the upper fourth; inner involucre bracts two to two and one-half times as long as the longest outer bracts 97.
- 97. Involucre green; body of achenes almost smooth, gradually terminated in cone 152. **T. subglaciale** Schischk.
- + Involucre dark green; body of achenes with a few, distinct, acute tubercles in the upper part, rather abruptly terminated in cone 151. **T. atratum** Schischk.
- 98. Body of achenes 2.5–3.0 mm long 99.
- + Body of achenes 3.5–4.6 mm long 100.
- 99. Involucre 9–12 mm long; body of achenes with numerous acute tubercles in the upper half. Altai 133. **T. compactum** Schischk.
- + Involucre 12–17 mm long; body of achenes with relatively fewer acute tubercles only in the upper third. Dzhungarian Alatau 132. **T. songaricum** Schischk.
- 100. Leaves 2–4 cm long, undivided, entire or with short teeth. Pamir 179. **T. tzvelevii** Schischk.
- + Leaves 4–12 cm long, pinnatipartite 101.
- 101. Terminal lobe of leaves larger than lateral lobes; outer involucre bracts membranous, lighter colored than inner bracts. Altai 189. **T. alaicum** Schischk.
- + Terminal lobe of leaves small and narrow; outer involucre bracts herbaceous, of same color as inner bracts. Western Tien Shan 127. **T. modestum** Schischk.
- 418 102. Alpine plants of the Carpathians; scapes glabrous or subglabrous; involucre dark green; body of achene 3.5–5.5 mm long 103.
- + Plants absent in the Carpathians 105.
- 103. Body of achenes with rather numerous, acute tubercles in the upper half, abruptly terminated in cone 16. **T. fontanum** Hand.-Mazz
- + Body of achenes with relatively fewer and shorter, acute tubercles in the upper third or fourth 104.
- 104. Involucre 8–15 mm long; outer involucre bracts ovate to

- lanceolate-ovate, more or less appressed to inner bracts
 17. **T. alpinum** Hegetschw. and Heer (cf. step 95).
- + Involucre 15–23 mm long; outer involucre bracts broadly lanceolate to lanceolate, usually more or less deflected from inner bracts 15. **T. nigricans** (Kit.) Rchb. (cf. step. 66)
105. Scapes below capitula with rather profuse arachnoid-hairy tomentum. Soviet Central Asia and Altai 106.
- + Scapes below capitula entirely glabrous or with a few flexuous hairs 109.
106. Body of achenes 4.0–4.5 mm long. Eastern Tien Shan
 137. **T. magnum** V. Koval.
- + Body of achenes 2.5–3.0 mm long 107.
107. Cone of achenes 0.75–1.0 mm long; plants of lower mountains and foothills 7. **T. ecornutum** S. Koval.
- + Cone of achenes 0.4–0.6 mm long 108.
108. All leaves undivided, with large teeth. Altai
 133. **T. compactum** Schischk. (cf. step. 99).
- + At least some leaves in rosette pinnatilobate or pinnatipartite. Hissar Range 136. **T. vassilczenkoi** Schischk.
109. Plants of Baltic Region 110.
- + Plants absent in Baltic Region 114.
110. Body of achenes 2.0–2.4 mm long; plants of dry meadows, grassy slopes 106. **T. dissimile** Dahlst.
- + Body of achenes 3.5–4.5 mm long; plants of more or less wet meadows 111.
111. Leaves undivided, usually more or less toothed, less often entire or with inconspicuous lateral lobes 112.
- + Leaves pinnatipartite or pinnatilobate 113.
112. Ligules of peripheral florets similarly colored on both surfaces .
 141. **T. decolorans** Dahlst.
- + Ligules of peripheral florets with wide dark stripe on inner surface
 142. **T. suecicum** Hagl.
113. Leaves usually with teeth between lobes or segments
 144. **T. balticum** Dahlst.
- 419 + Leaves usually without teeth between lobes and segments, often undivided 143. **T. lissocarpum** (Dahlst.) Dahlst.
114. Plants of Caucasus and European part of the USSR 115.
- + Plants of Soviet Central Asia and Kazakhstan 116.
115. Leaves undivided, more or less toothed. Transcaucasia
 195. **T. litwinowii** Schischk.
- + Leaves pinnatipartite. Don Basin 75. **T. klokovii** Litvinenko
116. Outer involucre bracts from broadly ovate outermost to lanceolate-ovate more inner, wider than inner bracts 117.

- + Outer involucral bracts from ovate or broadly lanceolate outermost to broadly lanceolate or lanceolate more inner, slightly wider than bracts or as wide 119.
- 117. Leaves 2–6 cm long, undivided, more or less toothed. Alai Range 131. **T. kirghizicum** Schischk.
- + Leaves 8–35 cm long, usually pinnatilobate or pinnatipartite, less often partly undivided, more or less toothed 118.
- 118. Body of achenes about 2.5 mm long; pappus about 5 mm long; leaves 8–17 cm long 8. **T. turgaicum** Schischk.
- + Body of achenes 3.0–3.5 mm long; pappus 6–7 mm long; leaves 15–35 cm long 9. **T. majus** Schischk.
- 119. Leaves undivided, more or less toothed, less often partly toothed, with transition to short lobes 120.
- + All leaves pinnatipartite or pinnatilobate 122.
- 120. Inner involucral bracts two and one-half to three times as long as longest outer bracts; plants of lowlands and lower mountain zone 88. **T. holophyllum** Schischk.
- + Inner involucral bracts one and one-half to two times as long as longest outer bracts; plants of upper mountain zone 121.
- 121. Leaves 4–10 cm long and 8–15 mm wide, usually subentire; outer involucral bracts light green, inner green 139. **T. rubtzovii** Schischk. (cf. also couplet 96)
- + Leaves 6–20 cm long and 1–4 cm wide, with large teeth; involucre dark green 27. **T. pseudoalpinum** Schischk.
- 122. Inner involucral bracts one and one-half to two times as long as longest outer bracts 123.
- + Inner involucral bracts two and one-half to three and one-half times as long as longest outer bracts 124.
- 123. Body of achenes 2.5–3.0 mm long; beak 6–7 mm long. Dzhungarian Alatau 14. **T. perpusillum** Schischk.
- 420 + Body of achene 3.2–3.6 mm long; beak 8.5–10.0 mm long. Eastern Tien Shan 28. **T. schischkinii** V. Korol.
- 124. Lateral lobes of leaves more or less narrowed toward base 87. **T. praecox** Schischk.
- + Lateral lobes of leaves broadened toward base 93. **T. microspermum** Schischk.
- 125(54) Plants of the Arctic and Far East 126.
- + Plants absent in the Arctic and Far East 169.
- 126. Both outer and inner involucral bracts, all or almost all with large (2–4 mm long) subterminal, often subacute cornicle 127.
- + Involucral bracts with small cornicles, latter often absent or either on outer or inner bracts 132.

127. Plants of Arctic Europe. Involucres green 64. **T. hjeltii** (Dahlst.) Dahlst.
 + Plants of Eastern Siberia and Far East 128.
128. Leaves usually undivided, sinuate-toothed, less often partly shallow-pinnatilobate; involucre dark green 129.
 + All leaves pinnatipartite or pinnatilobate 130.
129. Leaves 5–15 cm long and 1.0–2.5 cm wide; body of achenes 2.5–3.5 mm long; beak 7–9 mm long; pappus about 6 mm long 47. **T. ceratophorum** (Ldb.) DC.
 + Leaves 15–40 cm long and 2–3 cm wide; body of achenes about 4.5 mm long; beak about 12 mm long; pappus 8–10 mm long ..
 32. **T. chirleanum** Kitam.
130. Outer and inner involucre bracts dark green. North of Eastern Siberia 48. **T. longicorne** Dahlst.
 + Involucre green; outer involucre bracts usually lighter in color than outer [sic., inner] bracts, light green. Kamchatka 131.
131. Leaves 10–25 cm long; outer involucre bracts wider than inner 43. **T. longipes** Kom.
 + Leaves 6–13 cm long; outer involucre bracts only slightly wider than inner 50. **T. anchorifolium** Kom.
132. Scapes entirely glabrous or with a few flexuous hairs below capitulum 133.
 + Scapes below capitulum with more or less profuse lax arachnoid tomentum. Plants of Far East and Eastern Siberia 146.
133. Plants of Kamchatka and Kuril Islands 134.
 + Plants of Arctic, not found in Far East 138.
134. Inner involucre bracts two and one-half to three times as long as longest outer bracts .. 41. **T. schimushirense** Tataew. and Kitam.
 + Inner involucre bracts usually two times as long as longest outer bracts 135.
- 421 135. Inner involucre bracts without cornicle or with indistinct cornicle 45. **T. malaisei** Dahlst.
 + Inner involucre bracts with small, dark-colored, subterminal cornicle 136.
136. Body of achenes about 4 mm long; cone 1.0–1.5 mm long; pappus about 9 mm long 39. **T. ketoiense** Tatew. and Kitam.
 + Body of achenes about 3.5 mm long; cone 0.5–0.6 mm long; pappus 6–7 mm long 137.
137. Outer involucre bracts with rather long, subacute, subterminal cornicle 46. **T. hultenii** Dahlst.
 + Outer involucre bracts with small subterminal cornicle
 52. **T. evitatum** Dahlst.
138. Cone of achenes about 0.5 mm long 139.

- + Cone of achenes 0.8–1.0 mm long 142.
- 139. Beak of fully mature achenes 8–13 mm long; involucre usually green 140.
- + Beak (of fully mature achenes) 5–7 mm long; body of achenes 3.5–4.5 mm long; gradually terminated in cone; involucre dark green, usually more or less blackish 141.
- 140. Body of achenes about 3.5 mm long; pappus 6–7 mm long; involucre 13–15 mm long. Novaya Zemlya 69. **T. brevicorne** Dahlst.
- + Body of achenes about 4 mm long; pappus 8–9 mm long; involucre 18–22 mm long. Kola Peninsula 65. **T. murmanicum** Orlova.
- 141. Outer involucre bracts more or less appressed to inner; body of achenes with rather numerous acute tubercles in the apical third. Novaya Zemlya 146. **T. lyngeanum** Hagl. (cf. couplet 85)
- + Outer involucre bracts more or less deflected from inner bracts to deflexed body of achenes with fewer, shorter, acute tubercles in the apical third. Kola Peninsula 148. **T. nivale** Lge. ex Kithlm (cf. couplet 64).
- 142. All leaves pinnatipartite with long and narrow, entire or subentire lateral lobes, and small terminal lobe with intermediate teeth and lobules between lobes. Kola Peninsula 66. **T. norvegicum** (Dahlst.) Dahlst.
- + Leaves usually in the same rosette undivided, more or less toothed to pinnatilobate, less often all leaves undivided or leaves partly pinnatipartite with rather broad lobes 143.
- 143. All leaves undivided, entire or with distant short teeth, 2–8 mm wide. Kola Peninsula 147. **T. turiense** Orlova
- 422 + Leaves usually in the same rosette undivided, more or less toothed to pinnatipartite or pinnatilobate 144.
- 144. Involucre green; outer involucre bracts already at anthesis strongly deflected from inner bracts. Kola Peninsula 67. **T. simulium** Brenner
- + Involucre dark green; outer involucre bracts appressed to inner bracts 145.
- 145. Both outer and inner involucre bracts, all or some, with small but distinct cornicle 68. **T. novae-zemliae** Holomboe
- + Only fewer involucre bracts with very short cornicle 70. **T. brachyceras** Dahlst. (cf. couplet 84).
- 146(132). Body of achenes 5.0–5.5 mm long. Sakhalin 33 **T. pseudolasiathus** Koidz.
- + Body of achenes always less than 5 mm long 147.
- 147. Outer involucre bracts already from beginning of anthesis rather strongly deflected from inner bracts to deflexed. Far East ... 148.

- + Outer involucre bracts more or less appressed to inner bracts ... 153.
- 148. Leaves undivided, sinuate-toothed, less often partly pinnatilobate. Sakhalin 36 **T. miyakei** Kitam.
- + Leaves pinnatipartite, less often pinnatilobate 149.
- 149. Involucre 12–15 mm long; outer involucre bracts usually without cornicle; inner bracts, at least some, with short narrow cornicle; leaves 4–10 cm long. Kamchatka 61. **T. leproceras** Dahlst.
- + Involucre 15–25 mm long; outer involucre bracts with more or less long cornicle; leaves 7–35 cm long 150.
- 150. Body of achenes 4.0–4.5 mm long 44. **T. perlatescens** Dahlst.
- + Body of achenes about 3.5 mm long 151.
- 151. Cone of achenes 1.5–1.8 mm long. Sakhalin 34. **T. nairoense** Koidz.
- + Cone of achenes 0.8–1.2 mm long 152.
- 152. Beak of achenes 8–9 mm long. Pacific Coastal Region 20. **T. coreanum** Nakai
- + Beak of achenes 10–13 mm long. Kuril Islands 40. **T. yetrofuense** Kitam.
- 153. Inner involucre bracts three times as long as longest outer bracts. Kuril Islands 42. **T. shumushuense** Kitam.
- + Inner involucre bracts one and one-half to two times as long as longest outer bracts 154.
- 154. Involucre green or light green 155.
- 423 + Involucre dark green 157.
- 155. Involucre light green; outer involucre bracts with distinct network of veins and rather wide scarious border. South of eastern Siberia 123. **T. mongolicum** Hand.-Mazz.
- + Involucre green; outer involucre bracts with indistinct venation. Kamchatka 156.
- 156. Involucre 8–10 mm long; outer involucre bracts with more or less large but obtuse cornicle 62. **T. dilutum** Dahlst.
- + Involucre 14–18 mm long; outer involucre bracts with acute or subacute cornicle 49. **T. acricorne** Dahlst.
- 157. Outer involucre bracts all relatively narrow, lanceolate or oblong 158.
- + Other involucre bracts wider, outermost ovate or lanceolate-ovate 159.
- 158. Leaves 4–6 cm long Kuril Islands 58. **T. kojimae** Kitam.
- + Leaves 7–15 cm long. Sakhalin 35. **T. grandisquamatum** Koidz.

159. Inner involucral bracts usually one and one-half times as long as longest outer bracts 160.
 + Inner involucral bracts usually two times as long as longest outer bracts 163.
160. Leaves usually undivided, sinuate-toothed, less often some pinnatilobate. Sakhalin 35. **T. grandisquamatum** Koidz.
 + Leaves pinnatipartite or pinnatilobate 161.
161. Leaves 15–30 cm long and 2.5–6.0 cm wide. Kuril Islands 38. **T. shikotanense** Kitam.
 + Leaves 4.5–15.0 cm long and 1.2–2.5 cm wide 162.
162. Plants of eastern Siberia 59. **T. macilentum** Dahlst.
 + Plants of Kuril Islands 65. **T. vulcanorum** Koidz.
163. Outer involucral bracts with rather large subterminal cornicle; inner bracts with small, dark, subterminal cornicle. Kamchatka 164.
 + Outer involucral bracts with or without small indistinct subterminal cornicle 165.
164. Outer involucral bracts with scarious border, somewhat wider than inner bracts 51. **T. kljutshevskoanum** Kom.
 + Outer involucral bracts almost without scarious border, almost as wide as inner bracts 60. **T. koraginicola** Kom.
- 424 165. Involucre 15–18 mm long. Kuril Islands 55. **T. yamamotoi** Koidz.
 + Involucre (at anthesis) 11–15 mm long 166.
166. Inner involucral bracts without cornicle; all leaves pinnatipartite or pinnatilobate, 8–15 cm long and 20.5–5.5 cm wide 59. **T. platyceras** Dahlst.
 + Inner involucral bracts, all or some, with small cornicle; leaves usually partly undivided, more or less toothed, partly pinnatilobate, less often partly pinnatipartite 167.
167. Leaves 8–20 cm long 54. **T. koraginense** Kom.
 + Leaves 3–12 cm long 168.
168. Outer involucral bracts broadly ovate to ovate 56. **T. latisquameum** Dahlst.
 + Outer involucral bracts lanceolate-ovate to broadly lanceolate 57. **T. chamissonis** Greene.
- 169(125). Plants of European part of the USSR and Caucasus 170.
 + Plants of Soviet Central Asia and southern Siberia 176.
170. Involucral bracts, all or almost all, with rather large subterminal cornicle; flowering in April–May; Plants of desert steppe of Transcaucasia 109. **T. desertorum** Schischk.
 + Involucral bracts usually with smaller obtuse cornicle 171.
171. Flowering in May–June, plants of the plains of the European part of the USSR 172.

- + Flowering in July–August, plants of the upper and middle mountain zones of the Caucasus 174.
- 172. Body of achenes 2.0–2.4 mm long. Baltic Region 106. **T. dissimile** Dahlst. (cf. couplet 110).
- + Body of achenes 2.5–3.0 mm long 173.
- 173. Outer involucre bracts more or less deflexed from inner bracts, deflexed, with whitish or pinkish scarious border, longest of them about half as long as inner. Baltic Region 105. **T. xerophilum** Markl.
- + Outer involucre bracts usually more or less appressed to inner bracts, with very narrow, scarious border, longest of them about one-third to two-fifths as long as inner. Widely distributed species 104. **T. obliquum** (Fr.) Dahlst.
- 174. Body of achenes 4–5 mm long, with fewer, very short, acute tubercles in the upper third, gradually terminated in cone; beak 4–7 mm long 165. **T. stenolepium** Hand.-Mazz.
- + Body of achenes 3–4 mm long, always with numerous rather long, acute tubercles in the upper third, well-separated from cone; beak 6–9 mm long 175.
- 175. Cone of achenes about 1 mm long. Lesser Caucasus Mountains 72. **T. schelkovnikovii** Schischk.
- 425 + Cone of achenes 0.4–0.6 mm long. Greater Caucasus Mountains 71. **T. confusum** Schischk.
- 176. Outer involucre bracts at anthesis and later strongly deflected from inner bracts to deflexed. Soviet Central Asia 177.
- + Outer involucre bracts more or less appressed to inner bracts, less often only slightly deflected from them 184.
- 177. Outer involucre bracts broadly ovate to lanceolate-ovate, longest of them usually half as long as inner 12. **T. macrochlamideum** S. Koval.
- + Outer involucre bracts narrower, ovate to lanceolate, longest of them usually two-fifths as long as inner 178.
- 178. Leaves undivided, with fine and short teeth to subentire 84. **T. nikitinii** Schischk.
- + Leaves pinnatifid or pinnatilobate 179.
- 179. Outer involucre bracts with rather long, subterminal cornicle; inner bracts with small cornicles, usually two on each bract 78. **T. bicornis** Dahlst.
- + Outer involucre bracts with or without small subterminal cornicles; inner bracts usually with small cornicles, almost always one on each bract 180.
- 180. Body of achenes 3.5 mm long, with longer but fewer acute tubercles only in upper fourth 92. **T. nevskii** Juz.

- + Body of achenes with numerous acute tubercles in the upper half 181.
- 181. Body of achenes 2.5–3.0 mm long, with acute tubercles only in the upper half, below only with shorter, obtuse tubercles; cone 1.0–1.3 mm long 66. **T. monochlamideum** Hand.-Mazz.
- + Body of achenes almost to base with numerous acute tubercles. 182.
- 182. Body of achenes 2.2–2.8 mm long 83. **T. lipskyi** Schischk.
- + Body of achenes 3–4 mm long 183.
- 183. Outer involucre bracts light green, membranous; cone of achenes 0.5–0.8 mm long. Turkmenia 94. **T. aschabadense** Schischk.
- + Outer involucre bracts dark green, with very narrow scarious border; cone 0.7–1.0 mm long. Eastern Kazakhstan 76. **T. alatavicum** Schischk.
- 184. Body of achenes (2.2)2.5–3.0(3.2) mm long 185.
- + Body of achenes (3.2)3.5–4.5(5.0) mm long 197.
- 426 185. Florets whitish; involucre 7–10 mm long; leaves 2.5–9.0 cm long and 2–9 mm wide, undivided to pinnatipartite. Widely distributed species 172. **T. leucanthum** (Ldb.) Ldb. (cf. couplet 90).
- + Florets yellow or light yellow 186.
- 186. Beak of fully mature achenes 3.0–6.5 mm long; inner involucre bracts one and one-half to two times as long as longest outer bracts; leaves usually undivided, toothed, less often pinnatilobate 187.
- + Beak of fully mature achenes 7–12 mm long, less often (in *T. monochlamideum*) 6–9 mm long, but then inner involucre bracts two and one-half to three times as long as longest outer bracts 190.
- 187. Cone of achenes 1.0–1.8 mm long; beak 5–6 mm long, leaves undivided, with short teeth or entire. Southeastern Kazakhstan .. 100. **T. kok-sagyz** Rodin.
- + Cone of achenes 0.4–0.8 mm long 188.
- 188. Beak of fully mature achenes 3–4 mm long; leaves usually pinnatilobate, less often partly undivided or pinnatipartite. Western Tien Shan 194. **T. linczevskyi** Schischk.
- + Beak 4.5–6.5 mm long; leaves usually undivided, less often partly pinnatilobate 189.
- 189. Scapes below capitulum with slight arachnoid pubescence. Shugnan 136. **T. schugnanicum** Schischk.
- + Scapes below capitulum with profuse arachnoid-hairy tomentum. Eastern Tien Shan 129. **T. atrans** Schischk.
- 190. Outer involucre bracts broadly ovate to ovate, wider than inner

- bracts. Flowering in April–May, plants of lowlands and foothills 191.
- + Outer involucral bracts from ovate or broadly lanceolate to lanceolate, almost as wide as inner bracts or slightly wider 192.
191. Outer involucral bracts light green, longest of them half to two-fifths as long as inner bracts; body of achenes 3.0–3.5 mm long 90. **T. strobilocephalum** S. Koval.
- + Outer involucral bracts dark green, longest of them two-thirds to half as long as inner bracts; body of achenes 2.5–3.0 mm long. 12. **T. macrochlamideum** S. Koval. (cf. couplet 177).
192. Inner involucral bracts one and one-half to two times as long as longest outer bracts; leaves deeply pinnatipartite with rather narrow lateral lobes and small terminal lobe. Altai, Sayans 193.
- + Inner involucral bracts usually two and one-half times as long as longest outer bracts. Soviet Central Asia 194.
- 427 193. Involucre 13–18 mm long; scapes arachnoid-pubescent below capitula. Sayans 108 **T. printzii** Dahlst.
- + Involucre 9–13 mm long; scapes glabrous or with few hairs below capitula. Altai 107. **T. stenolobum** Stschegl.
194. Cone of achenes about 0.5 mm long. Flowering in June–July. Plants of middle mountain zone 79. **T. elongatum** S. Koval.
- + Cone of achenes 0.8–1.3 mm long, flowering in April–May. Plants of lowlands and lower mountain zone 195.
195. Corolla with short straight hairs only in middle, often subglabrous 86. **T. monochlamideum** Hand.-Mazz (cf. couplet 184)
- + Corolla with long flexuous and short straight hairs in middle 196.
196. Outer involucral bracts dark green; corolla profusely covered with long, flexuous hairs in middle 89. **T. maracandicum** S. Koval.
- + Outer involucral bracts light green; corolla only with occasional long, flexuous hairs in middle 80. **T. juzepczukii** Schischk.
- 197 (184) Beak of fully mature achenes 1–4 mm long 198.
- + Beak of fully mature achenes always more than 4 mm long, usually exceeding 6 mm 206.
198. Leaves 15–25 cm long and 1.5–2.5 cm wide, pinnatipartite. Kugitang 193. **T. gnezdilloi** S. Koval.
- + Leaves 2–12 cm long and 0.2–2.0 cm wide 199.
199. Body of achenes 4.0–5.5 mm long, smooth or almost smooth (in the upper part with few very short, usually inconspicuous, acute or subobtus tubercles), gradually and imperceptibly terminated in cone 200.

- + Body of achene with rather numerous acute tubercles in the upper part 203.
- 200. Scapes entirely glabrous; beak 1–2 mm long. Dzhungarian Alatau 178. **T. goloskokovii** Schischk.
- + Scapes with lax tomentum below capitula 201.
- 201. Pappus 6–7 mm long; beak 2.5–3.5 mm long; leaves lyrate-pinnatipartite. Altai 187. **T. lyratum** (Ldb.) DC.
- + Pappus 4–5 mm long; leaves undivided to pinnatipartite. Soviet Central Asia 202.
- 202. Beak of fully mature achenes 3–4 mm long, gradually terminated in cone; all leaves undivided. Eastern Tien Shan 177. **T. heptapotamicum** Schischk.
- 428 + Beak 1–2 mm long, distinctly separated from cone; leaves often pinnatipartite or pinnatilobate. Western Tien Shan 183. **T. pseudominutilobum** S. Koval.
- 203. Florets whitish, all leaves deeply pinnatipartite, 5–12 cm long and 7–15 cm long mm wide. Altai 188. **T. aksaicum** Schischk.
- + Florets yellow or light yellow. Mountains of Soviet Central Asia 204.
- 204. Body of achenes 4–5 mm long, with fewer acute or subotuse tubercles in the third 182. **T. brevirostre** Hand.-Mazz.
- + Body of achenes 3.5–4.0 mm long, with numerous acute tubercles in the upper third. Pamirs 205.
- 205. Pappus 6–7 mm long; cone 0.6–1.0 mm long; leaves 2–10 cm long, undivided to shallow pinnatipartite 180. **T. pojarkoviae** Schischk.
- + Pappus about 5 mm long; cone about 0.4 mm long; leaves 2–5 cm long, undivided, entire or with remote short teeth 178. **T. tzvelevii** Schischk. (cf. couplet 100)
- 206. Body of achenes 3.5–4.5 mm long, covered with numerous acute tubercles almost to the base. Eastern Tien Shan and Dzhungarian Alatau 101. **T. brevicorniculatum** V. Korol.
- + Body of achenes with acute tubercles only in the upper half, below only with very short, obtuse tubercles or smooth (but sometimes with very fine spinules) 207.
- 207. Leaves undivided, more or less sinuate-toothed to subentire, less often partly short-lobate; pappus 7–8 mm long. Altai and Saur.. 208.
- + Leaves usually pinnatilobate or pinnatipartite, less often partly undivided, sinuate-toothed 209.
- 208. Leaves 4–8 cm long; beak of fully mature achenes 7–8 mm long 135. **T. pingue** Schischk.

- + Leaves 6–25 cm long; beak 8.5–10.0 mm long 134. **T. altaicum** Schischk.
- 209. Plants of eastern Siberia 210.
- + Plants of Soviet Central Asia 211.
- 210. Involucre 12–14 mm long, light green 123. **T. mongolicum** Hand.-Mazz. (cf. couplet 155).
- + Involucre 15–16 mm long, dark green 59. **T. macilentum** Dahlst. (cf. couplet 162)
- 211. Body of achenes 4.5–5.0 mm long; all or almost all involucre bracts with rather large subotuse subterminal cornicle 212.
- + Body of achenes 3–4 mm long 213.
- 429 212. Outer involucre bracts broadly ovate to broadly lanceolate, with wide scarious border 201. **T. seravschanicum** Schischk.
- + Outer involucre bracts lanceolate-ovate to lanceolate, almost without scarious border 99. **T. butkovii** S. Koval.
- 213. Flowering in April–May, plants of lowlands and lower mountain zone 214.
- + Flowering in June–August, plants of upper mountain zone .. 216.
- 214. Outer involucre bracts dark green, lanceolate-ovate to lanceolate 89. **T. maracandicum** S. Koval. (cf. couplet 196).
- + Outer involucre bracts light green considerably wider, broadly ovate to lanceolate-ovate 215.
- 215. Inner involucre bracts with short obtuse subterminal cornicle.... 77. **T. contristans** S. Koval.
- + Inner involucre bracts without cornicle 90. **T. strobilocephalum** S. Koval. (cf. couplet 191).
- 216. Leaves 15–25 cm long, Kugitang 193.. **T. gnezdiloi** S. Koval (cf. couplet 198).
- + Leaves 4–15 cm long 217.
- 217. Outer involucre bracts lanceolate-ovate to broadly lanceolate, dark green, longest of them two-thirds to half as long as inner bracts. Pamir 126. **T. stanjukoviczii** Schischk.
- + Outer involucre bracts broadly ovate to lanceolate-ovate, light green, longest of them half to two-fifths as long as inner bracts 218.
- 218. Pappus about 5 mm long; corolla subglabrous. Saur Range 128. **T. saposhnikovii** Schischk.
- + Pappus 7–8 mm long; corolla with rather numerous but short hairs in middle. Pamir 125. **T. badachschanicum** Schischk.

Section 1. **Spuria** (DC.) Hand.-Mazz. Monogr. Tarax (1907) 124.—*Taraxacum* § 1. *Spuria* DC. Prodr. VII (1838) 145.—Relatively large or medium plants of plains and low mountains with thick, usually many-headed root, flowering in June–October; root collars with rather profuse

brownish tomentum in axils of leaves. Leaves coriaceous-herbaceous, grayish-green, rather profusely pubescent. Scapes usually covered with more or less profuse arachnoid-hairy tomentum, sometimes branched. Involucral bracts always without cornicle, coriaceous-herbaceous, outer ones numerous, outermost more or less deflexed, others more or less appressed to inner bracts, latter usually one and one-half times as long as longest outer ones. Florets yellow; achenes light brown, body of achenes
 430 4.5–7.0 mm long; covered with acute tubercles in the upper part, apically fairly gradually terminated into 0.8–2.5 mm long cone; beak 5–14 mm long.

Type of section: *T. montanum* (C.A.M.) DC.

1. ***T. montanum*** (C.A.M.) DC. Prodr. VII (1838) 154; Ldb. Fl. Ross. II, 811; Boiss. Fl. or III, 786, p. p.; Hand.-Mazz. Monogr. Tarax. (1907) 127; Schischk. in Grossh. Fl. Kavk. IV (1934) 247; Grossh. Opred. Rast. Kavk. 513; Schischk. in Fl. Turkm. VII, 321; Sofieva in Fl. Azerb. VIII, 543; Kovalevskaya in Fl. Uzb. VI, 477, p. p.—*Leontodon montanus* C.A.M. Verzeichn. (1831) 58.—**lc.**: Hand.-Mazz. op. cit. t. 3, fig. 18; Sofieva, op. cit. Plate 53, Fig. 2.

Perennial. Plants 10–40 cm high, with thick often many-headed root; root collar covered with brownish remnants of dead leaves, with more or less profuse brownish tomentum in their axils. Leaves 8–30 cm long and 1.5–6.0 cm wide, coriaceous-herbaceous, grayish-green, more or less covered with rather profuse, short, flexuous hairs on both surfaces, runcinately pinnatifid, with more or less toothed lateral lobes and usually larger terminal lobe. Scapes more or less arachnoid-hairy pubescent, with more profuse arachnoid-hairy tomentum below capitula, simple or with one to three lateral branches originating from axils of scale-like floral [bracteal] apical leaves. Involucre 15–25 mm long, glabrous or subglabrous, glaucescent-green; outer involucral bracts ovate to broadly lanceolate, numerous, outermost usually more or less recurved, others more or less appressed to inner bracts and wider than them, without cornicle; inner involucral bracts oblong-linear, usually one and one-half to two times as long as longest outer, without cornicle. Florets yellow. Achenes brownish, body 5–6 mm long, with few longitudinal furrows, with numerous tubercles almost from base coalescing in transverse ridges; tubercles longer and acute in the upper part. short and obtuse in the lower part, cone 1.5–2.5 mm long; beak 8–14 mm long; pappus 8–10 mm long, whitish, often with brownish tinge. Flowering July to August (Plate XXV, Fig. 3).

Stony and rubbly slopes, debris, gravel-beds, mainly in lower and middle mountain zones.—*Caucasus*: Southern and Eastern Transcaucasia, Talysh; *Soviet Central Asia*: ?mountainous Turkmenia. *General distribution*: Armenia and Kurdistan, Iran. Described from Azerbaidzhan SSR. Type in Leningrad.

2. **T. syriacum** Boiss. Diagn. pl. or. ser. 2, III (1856) 96; Hand.-Mazz. Monogr. Tarax. (1907) 125; Grossh. Opred. Rast. Kavk. 512; Sofieva in Fl. Azerb. VIII, 544, in note.—*T. turcomanicum* Schischk. in Fl. Turkm. VII (1960) 317 and 382.—*T. montanum* auct. non DC.: Boiss. Fl. or. III, 786, p. p.; Kovalevskaya in Fl. Uzb. VI, 477 p. p.—**lc.**: Hand.-Mazz. op. cit. t. 3, fig. 17 and t. 5, fig. 9.

Perennial. Plants 8–20 cm high, wide, with rather thick, often many-headed root, root collar covered with brownish remnants of dead leaves, 431 with more or less profuse brownish tomentum in their axils. Leaves 7–20 cm long and 1.5–6.0 cm wide, grayish-green, coriaceous-herbaceous, covered with more or less scattered, crisped or longer, flexuous hairs on both surfaces, usually runcinately pinnatifid, with more or less deflexed, toothed, lateral lobes and smaller terminal lobe, less often undivided, more or less toothed. Scapes more or less covered with lax, arachnoid-hairy tomentum, more dense capitula, simple but often with one or two scaly apical leaves. Involucre 14–25 mm long, glaucescent- or grayish-green; involucre bracts without cornicles, outer broadly lanceolate to lanceolate, outermost more or less recurved, others more or less appressed to inner bracts, usually slightly wider than inner; inner oblong-linear, one and one-half to two times as long as longest outer. Florets yellow. Achenes light brown; body 5–7 mm long, more or less covered with acute tubercles in the upper half, often coalesced in transverse ridges, apically rather gradually terminated into 1.0–1.6 long cone; beak 7–12 mm long; pappus 7–10 mm long, often with weak brownish tinge. Flowering June to August.

Stony and clayey slopes, debris, gravel-beds, in lower and middle mountain zones.—*Caucasus*: Eastern Transcaucasia (Apsheron Peninsula), Talysh; *Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan, Syr-Darya, Amu-Darya, Pamiro-Alai (western part), mountainous Turkmenia. *General distribution*: Iran, Afghanistan, West Asia. Described from Syria. Type in Geneva.

Note. Apparently this species is entirely replaced in Soviet Central Asia by a very similar species —*T. montanum*—that, besides other characters, differs from it by always having unbranched scapes. Most Soviet Central Asian specimens have achenes with shorter beaks and pappuses, possibly forming a separate, more northern, ecogeographic race, closer to the next species.

3. **T. serotinum** (Waldst. and Kit.) Poir. in Lam. Encyl. meth. Suppl. IV (1816) 420; DC. Prodr. VII, 147; Ldb. Fl. Ross. II, 811; Boiss. Fl. or. III, 786 p. p.; Schmalh. Fl. II, 148; Hand.-Mazz. Monogr. Tarax. (1907) 21; Schischk. in Grossh. Fl. Kavk. IV (1934) 246; Grossh. Opred. Rast. Kavk. 512; Schischk. in Kryl. Fl. Zap.. Sib. XI, 2997; Klovov in Vzn. Rosl. URSR, 592; Kapeller in Fl. Gruzii, VIII, 658; Sofieva in Fl. Azerb.

VIII, 537.—*Leontodon serotinus* Waldst. and Kit. Descr. et icon. pl. rar. hung. II (1805) 119.—*L. lanatus* Ldb. in Mém. Acad. Sc. Pétersb. V (1814) 554, non L. (1755).—**lc.**: Waldst. and Kit. op. cit. t. 114; Rchb. Ic. Fl. Germ. XIX, t. 51; Hand.-Mazz. op. cit. t. 1, fig. 5.—**Exs.**: Fl. exs. austro-hung. No. 207; Herb. norm. No. 4062; Fl. polon. exs. No. 358.

Perennial. Plants 6–25 cm high, with thick, ascending or vertical, often many-headed root; root collar covered with numerous remnants of dead leaves, with rather profuse brownish tomentum in their axils. Leaves 5–20 cm long and 1.5–6.0 cm wide, coriaceous-herbaceous, grayish-green, 432 more or less crisped hairy on both surfaces, from undivided, more or less toothed to runcinately pinnatipartite, with more or less deflexed, irregularly toothed lateral lobes and smaller terminal lobe. Scapes covered entirely or almost entirely with lax arachnoid-hairy tomentum. Involucre 10–18 mm long; outer involucre bracts lanceolate to lanceolate-linear, usually more or less deflected from inner bracts and slightly narrower than latter, rather numerous, without cornicles; inner bracts oblong-linear; one and one-half to two times as long as longest outer bracts, without cornicle. Florets yellow. achenes light brownish-gray, body 4.5–5.5 mm long, with few longitudinal ridges, with rather short, acute tubercles in the upper half or third, very gradually terminated into 0.8–1.2 mm long cone; beak 5–8 mm long, pappus 7–8 mm long; often with brownish tinge. Flowering June to October.

Steppes, on dry grassy slopes, roadsides.—*European Part*: Upper Dniester, Middle Dniester, Volga-Don, Trans-Volga, Bessarabia, Black Sea Region, Lower Don, Lower Volga, Crimea; *Caucasus*: Ciscaucasia, Dagestan, Eastern and Southern Transcaucasia; *Western Siberia*: Upper Tobol (rarely). *General distribution*: Central Europe. Balkans-Asia Minor, Armenia and Kurdistan. Described from Hungary. Type in Budapest.

Section 2. *Taraxacum*.—*Taraxacum* sect. *Borealia* Hand.-Mazz. Monogr Tarax. (1907) 58 p. p.—Rather large, medium, less often small plants, with more or less thick root; root collar glabrous or with more or less profuse brownish tomentum in axils of leaves. Leaves herbaceous. Scapes with lax, arachnoid-hairy tomentum below capitula, less often glabrous. Involucre bracts without or with cornicles. Florets yellow or light yellow. Achenes light brown, brownish or reddish brown; body almost always with numerous, acute tubercles in upper half, rather abruptly terminated in cone; beak always more than one and one-half, often more than two times as long as body of achenes.

Type of section : type of genus.

Note. The largest and the most polymorphic section of the genus, in which I have included a whole series of more or less well-separated groups

of species, characterized mainly by a long beak and an achene body that quite abruptly terminates in a cone.

Subsection 1. *Gymnophylla* Hand.-Mazz. Monogr. Tarax (1907) 70 p. p.—*Taraxacum* sect. *Borealia* subsect. *Gymnophylla* ser. *Vulgaria* Hand.-Mazz. Ibid. 73, p. p. —*T. grex vulgaria* Dahlst. in Lindm. Svensk Fanerogamfl. ed. 2 (1926) 562.— Rather large or medium plants of plains or lower mountains with more or less thick root, flowering usually in April–June; root collar glabrous. Scapes almost always with profuse arachnoid-hairy tomentum below capitula, less often only with few flexuous hairs. Involucral bracts without cornicle, outer more numerous, 433 more or less deflected from inner bracts to deflexed, less often more or less appressed to inner; bracts usually one and one-half times as long as longest outer. Florets yellow, with long hairs in middle of corolla. Achenes light brown, body 2.5–4 mm long, covered with acute tubercles in upper part; cone 0.4–1.0 mm long; beak 7–13 mm long, always more than one and one-half but usually more than two times as long as body of achenes.

Type of subsection : type of genus.

4. ***T. officinale*** Wigg. Primit. Fl. Holsat. (1780) 56; Ldb. Fl. Ross. II, 811, p. p.; Boiss. Fl. or. III, 787 p. p.; Schmalh. Fl. II, 148; Schischk, in Grossh. Fl. Kavk. IV (1934) 250 and in Fl. Yugo-Vost. VI, 462; Schischk. in Kryl. Fl. Zap. Sib. XI, 3007; Klovov in Vizn. Rosl. URSS, 592; Mikhailovskaya in Fl. BSSR, V. 184; Schischk. in Fl. Turkm. VII, 320; Sofieva in Fl. Azerb. VIII, 540; Kovalevskaya in Fl. Uzb. VI, 476.—*Leontodon taraxacum* L. sp. pl. (1753) 798, p. p.; M.B. Fl. taur.-cauc. III (1819) 590.—*Taraxacum vulgare* Schrank. Primit. Fl. Salisburg. (1792) 193; Hand.-Mazz. Monogr. Tarax. (1907) 88; Kom. and Alis. Opred. Rast. Dalnevost. Kr. II, 1097; Grossh. Opred. Rast. Kavk. 513; Kapeller in Fl. Gruzii, VIII, 664. —*T. densleonis* Lam. and DC. Fl. franc. ed. 3 IV (1815) 45; DC. Prodr. VII, 145.— **Ic.:** Rchb. Ic. Fl. Germ XIX, t. 53; Hand.-Mazz. op. cit., t. 3, fig. 2 Fedtsch. and Fler. Fl. Evrop. Ross. 1053; Syreitsch. Ill. Fl. Mosk. Gub. III, 329; Hegi, Ill. Fl. VI, 2 (1028) fig. 762, 763, 766 and t. 277, fig. 1 Jav. and Csap. Ic. Fl. Hungar. (1933) 558; Zemlinskii, Lekarstv. Rast. SSSR, ed. 2 (1951) 199; Mikhailovskaya, op. cit. Plate 58.— **Exs.:** Fl. exs. austro-hung. No. 204; Fl. polon. exs. No. 359

Perennial. Plants. 5–50 cm high, with more or less thick, usually vertical root; root collar more or less woolly, less often glabrous. Leaves 10–25 cm long and 1.5–5.0 cm wide, runcinately pinnatipartite or pinnatilobate, with more or less deflexed, often toothed, lateral lobes and larger terminal lobes, less often undivided, sinuate-toothed, scatteredly hairy to entirely glabrous. Scapes with more or less profuse arachnoid-hairy tomentum. Involucre 13–20 mm long, green, outer involucral bracts

broadly lanceolate to lanceolate-linear, more or less recurved, almost as wide as inner or wider, without scarious border or with very narrow membranous border, without cornicle; inner involucre bracts oblong-linear, one and one-half times or less as long as longest outer bracts without cornicle, less often with indistinct cornicle. Florets yellow with profuse long hairs in middle part of corolla; peripheral florets usually with dark stripes on lower side of ligules. Achenes light brown or brownish, body of achenes 3–4 mm long, covered with acute tubercles in upper half; cone 0.4–0.6 mm long, beak 7–12 mm long; pappus 6–8 mm long, white. Flowering April to June.

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Meadows, forest glades, gardens and parks, along roads, in populated places.—*European Part*: All regions; *Caucasus*: All regions; *Western Siberia*: All regions; *Eastern Siberia*: Yenisei (southern part), Angara-Sayans, Dauria; *Far East*: Zeya-Bureya, Ussuri, Uda Region, Sakhalin; *Soviet Central Asia*: all regions. *General distribution*: almost all of Europe, greater part of Asia; as introduced plant also in North and South America, Australia, South Africa. Described from western Europe. Type in London.

Note. I consider this highly polymorphic species here in its broad sense, although many authors separate within it a large number of narrowly circumscribed apomictic species that have lost the capacity for fertilization by pollination and are often found in small numbers in the same place. Many species especially of the *T. officinale* s. l. complex have been described from Scandinavian countries and generally from northern Europe, including Estonia and Karelia. Thus for Karelia, G. Marklund (in *Acta Soc. pro fauna et flora fennica* XXXIV, No. 7, 1911) cites 23 species of the *T. officinale* s. l. complex, six of which are described from Karelia. For Estonia G. Marklund (in *Acta bot. fennica*, XXIII, 1938) reported 120 species in this group, a large number of which were described from Estonia. For want of space, the list of these species is not given here. Those interested should refer to the above-cited works of G. Marklund. An attempt to study the apomictic species of the *T. officinale* s. l. complex in the territory of the Uzbek SSR was made by S.S. Kovalevskaya (in *Fl. Uzb.* VI (1962) 476–477). In the cited work, she has provided a key to the identification of the following six unpublished species of this complex: *T. medium* S. Koval., *T. pseudoobliquum* S. Koval., *T. reflexum* Schischk. (Lapin *Opred. Rast. Tashkentsk.*; *Oazisa* [Identification of Plants of the Tashkent Oasis] I (1938) 316, diagnoses in Russian), *T. tardum* S. Koval., *T. vallicola* S. Koval. and *T. vvedenskyi* S. Koval.

Economic Importance. The roots of *T. officinale* are used for medicinal purposes to stimulate appetite and to improve the activity of the digestive organs. Young leaves of this species are used as salad, while, like chicory, its roasted roots can serve as a substitute for coffee. It is a widely distributed weed in gardens and parks, especially often in lawns.

5. **T. almaatense** Schischk. sp. nova in Addenda XXVIII, 728.

Perennial. Plants with rather thick vertical root; root collar covered with brownish remnants of dead leaves. Leaves rather numerous, 10–30 cm long and 1–5 cm wide, glabrous or slightly arachnoid-pubescent, runcinately pinnatipartite, with larger and acute terminal lobe and horizontal or deflexed, acuminate lateral lobes, usually with scattered, long-acuminate teeth between lobes, apically terminating in cusp. Scapes almost as long as leaves, two to six, subglabrous or more or less arachnoid-pubescent below capitulum. Involucre 13–18 mm long; outer involucre 435 bracts more or less deflected from inner and wider than them, ovate to ovate-lanceolate, green, without cornicles; inner bracts usually one and one-half times as long as longest outer; also without cornicles. Florets yellow, with profuse long hairs in middle part of corolla, peripheral florets with dark stripe on the lower side of ligules. Achenes light brown, body 3.0–3.5 mm long, covered with acute tubercles in the upper half; cone about 0.5 mm long; beak rather slender, 7–8 mm long, pappus 6–7 mm long, white. Flowering May to June.

Meadows, forest glades and along roads.—*Soviet Central Asia*: Tien Shan. Endemic. Described from vicinity of Alma-Ata. Type (vicinity of Alma-Ata, near village of Remizovka 26.V.1934, L. Kuprianova) and isotypes in Leningrad.

6. **T. complicatum** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 14 and in Fl. Uzb. VI, 475.

Perennial. Leaves herbaceous, dark green, scatteredly short-hairy on both surfaces and with long hairs along midrib, 15–30 cm long and 3–6 cm wide, pinnatipartite with numerous unequal lateral lobes; basal leaves broad-deltoid; entire, or short and sharp-toothed along upper margin, slightly deflexed; terminal lobe larger than laterals. Scapes rather thick, lax arachnoid pubescent mostly in the upper part, at anthesis almost as long as or longer than leaves. Involucres 10–15 mm long; outer involucre bracts dark green, reddish along a margin, broadly lanceolate to lanceolate, rather strongly deflected from inner bracts, without cornicles; inner bracts oblong-linear, one and one-half times and more as long as longest outer bracts, more or less reddish at the apex, without cornicles. Florets bright yellow, peripheral ones with dark stripes on lower side of ligule; corolla covered with long flexuous hairs in middle part, with small mixture of short straight hairs. Achenes light brownish-gray; body 3.0–3.5 mm long, covered with acute tubercles in the upper part, below only with short obtuse tubercles; cone about 0.75 mm long; beak about 10 mm long; pappus 5–6 mm long, white. Flowering April to May.

Gardens and parks, roadsides, along banks of irrigation channels.—*Soviet Central Asia*: Syr-Darya. Endemic? Described from a park in Margelan. Type in Tashkent.

Note. Apparently, this species does not differ significantly from *T. officinale* s. l. and is one of the apomictic species of this complex.

7. ***T. ecornutum*** S. Koval. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk UzbSSR, XVII (1962) 14 and in Fl. Uzb, VI, 472.—*T. alpinum* auct. non Hegetschw. and Heer: Hand.-Mazz. Monogr. Tarax (1907) 94, p. p. (quoad pl. Fedtschenkoanum).

436 Perennial. Plants with fairly thick root; root collar with fewer remnants of dead leaves. Leaves 8–25 cm long and 2–4 cm wide, green, glabrous or scatteredly hairy, runcinately pinnatipartite, with entire or more or less toothed, usually slightly deflected downward lateral lobes; terminal lobe smaller. Scapes almost as long as leaves at anthesis, with more or less profuse lax arachnoid tomentum below capitula. Involucre 12–16 mm long; involucre bracts herbaceous, without subterminal cornicles; outer involucre bracts broadly lanceolate, only slightly deflected from inner bracts and slightly wider than them, almost without scarious border; inner bracts oblong-linear, one and one-half times as long as longest outer. Florets orange yellow; peripheral florets with dark stripes on lower side of ligules covered with scattered, short, straight and longer flexuous hairs in the lower part of corolla limb and in the upper part of its tube. Achenes light brown; body about 3 mm long, covered with acute tubercles in the upper part; cone 0.75–1.0 mm long; beak 7 mm long; pappus 5–6 mm long, whitish. Flowering April to May.

Meadows, banks of irrigation channels, oases and along roads.—*Soviet Central Asia*: Syr-Darya, Tien Shan (western part), Kyzyl-Kum, Pamiro-Alai (western part). Endemic. Described from Tashkent. Type in Tashkent.

8. ***T. turgaicum*** Schischk. sp. nova in Addenda XXVIII, 728.

Perennial. Plants 8–25 cm high, with rather thick, often many-headed root; root collar glabrous or weakly hairy. Leaves 8–17 cm long and 1.5–4.0 cm wide, weakly glaucescent, subglabrous, usually runcinately pinnatipartite, with more or less deflexed lateral lobes, three to five on each side, sometimes toothed on anterior margin, and more or less large terminal lobe; outer leaves in rosette sometimes pinnatilobate or even undivided, sinuate-toothed. Scapes two to six, with weak arachnoid pubescence only below capitula. Involucres 13–18 mm long, with weak glaucous tinge; outer involucre bracts ovate to lanceolate-ovate, more or less appressed to inner bracts or partly more or less deflected from latter, much wider than inner bracts, and generally larger, light green, almost without scarious border, dark in upper part, without cornicles or with indistinct cornicles; inner bracts oblong-linear, one and one-half times as long as longest outer, green, subapically dark, usually without cornicles. Florets yellow, with profuse long hairs in middle part of corolla; peripheral florets with wide dark stripes on the lower side of ligules. Achenes light

brown; body about 2.5 mm long, with rather numerous but shallow longitudinal furrows, covered with acute tubercles in the upper half, with subacute and obtuse tubercles below almost to base; cone about 0.8 mm long; beak 8–1.1 mm long; pappus about 5 mm long, white. Flowering May to June.

- 437 Moist, usually alkaline meadows.—*Western Siberia*: Upper Tobol (southern part); *Soviet Central Asia*: Aralo-Caspian. Endemic. Described from Aktyubin Region of Kazakhstan. Type (Aktyubin Region between Tumali-Kul lakes, 3.VI.1927, No. 101, O. Knorring and N. Belov) and isotype in Leningrad.

9. **T. majus** Schischk. sp. nova. in Addenda XXVIII, 729.

Perennial. Plants with rather thick, often many-headed root. Leaves 15–35 cm long and 2–6 cm wide, subglabrous, from undivided, irregularly large-toothed to runcinately pinnatipartite, with wide, more or less deflexed, lateral lobes, two to four on each side, and much larger terminal lobe. Scapes at anthesis almost as long as leaves, with weak arachnoid pubescence below capitula. Involucre 15–20 mm long; outer involucre bracts broadly lanceolate to lanceolate-ovate, more or less appressed to inner bracts (but more or less deflected in fruit) and wider than them, dark- and glaucous-green, with narrow, scarious border, without cornicles or with indistinct cornicles, oblong-linear, one and one-half to two times as long as longest inner bracts, latter without cornicles or with indistinct cornicles. Florets yellow with short hairs in the middle of corolla. Achenes light yellowish-brown; body 3.0–3.5 mm long, with few longitudinal furrows, covered with acute tubercles in the upper third; cone 0.6–0.8 mm long; beak 7–10 mm long; pappus 6–7 mm long, white. Flowering May to June.

Meadows, herb slopes, in cheegrass, mostly in middle and lower mountain zones.—*Soviet Central Asia*: Balkhash Region (southern part), Tien Shan (eastern part), Dzhungaria-Tarbagatai. *General distribution*: possibly also found in regions bordering China. Described from Ketmen Range. Type (Kazakh SSR, in foothills of Labas Mountain, 30.VI.1936, No. 37, collector unknown) and isotype in Leningrad.

10. **T. grossheimii** Schischk. in Grossh. Fl. Kavk. IV (1934) 250; Grossh. Oprod. Rast. Kavk. 513; Kapeller in Fl. Gruzii, VIII, 663; Sofieva in Fl. Azerb. VIII, 542. —*T. obliquum* auct. non Dahlst.: Hand.-Mazz. Monogr. Tarax. (1907) 116, p. p.

Perennial. Plants 6–25 cm high, with rather thick root; root collar covered with brownish remnants of dead leaves, glabrous or subglabrous. Leaves glabrous or scatteredly hairy, 7–18 cm long and 1.2–4.5 cm wide, runcinately pinnatipartite, with more or less deflexed, often toothed lateral lobes and larger terminal lobe. Scapes more or less densely arachnoid-

pubescent below capitula, sometimes subglabrous. Involucre 10–15 mm long; outer involucre bracts ovate to broadly lanceolate, more or less deflected from inner bracts (to recurved) and wider than them, herbaceous, light green, without cornicles; inner bracts oblong-linear, one and one-half to two times as long as longest outer, herbaceous, green, without subterminal cornicle or with indistinct cornicle. Florets, yellow, with profuse long hairs in the middle part of corolla. Achenes brownish, body 3.0–3.5 mm long, with rather numerous acute tubercles in the upper half, with only short obtuse tubercles below; cone 0.6–0.8 mm long, well separated from beak; 8–13 mm long; pappus 5–7 mm long, whitish, sometimes with brownish tinge. Flowering April to May.

Dry, thinly turfed slopes, along roads, close to inhabited areas. — *Caucasus*: Southern and Eastern Transcaucasia, Tylish. Endemic (?). Described from vicinity of Tbilisi. Type (near Mtskheth railroad station, 3.V.1924, A. Grossheim) in Leningrad.

11. **T. macrolepium** Schischk. in Grossh. Fl. Kavk. IV (1934) 249; Addenda, XXVIII, 729.

Perennial. Plants 8–30 cm high, with rather thick vertical root. Leaves 10–25 cm long and 2–6 cm wide, scatteredly hairy to subglabrous, usually runcinately pinnatipartite or pinnatilobate, with horizontal or somewhat deflexed lateral segments or lobes often having toothed upper margin, and rather large [terminal] lobe, irregularly toothed between segments, with teeth extended in long cusp. Scapes rather thick, more or less arachnoid-pubescent below capitula. Involucres 13–17 mm long; outer involucre bracts lanceolate-ovate to broadly lanceolate, more or less deflected from inner bracts to recurved, somewhat wider than inner, membranous, light green, with wide, scarious border, without cornicles; inner bracts oblong-linear, usually, one and one-half times as long as longest outer, green, without cornicles or with indistinct cornicles. Florets yellow or light yellow? Peripheral florets with wide dark stripe on lower side of ligules; corolla with scattered short or longer hairs in the middle part. Achenes light yellowish-brown, body 3.5–4.0 mm long, covered with acute tubercles in the upper third or half, with few longitudinal furrows; cone 0.5–0.7 mm long; beak 11–13 mm long; pappus about 8 mm long, white. Flowering VI–VII.

Meadows, herb slopes in middle mountain zone.—*Caucasus*: ?Southern Transcaucasia. *General distribution*: Armenia and Kurdistan. Described from northeastern Turkey (vicinity of Sarykamys). Type and isotype in Leningrad.

12. **T. macrochlamideum** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 12 and in Fl. Uzb. VI, 470.

Perennial. Plants with rather thick, often many-headed root. Leaves

10–20 cm long and 2–3 cm wide, glabrous or subglabrous, runcinately pinnatipartite, with more or less deflexed lateral lobes, three to six on each side having often more or less toothed upper margin and small terminal lobe, often with intermediate teeth between lobes. Scapes usually
 439 almost as long as leaves, few, more or less arachnoid-pubescent, with more profuse arachnoid pubescence below capitula. Involucre 13–15 mm long; outer involucre bracts broadly ovate to lanceolate-ovate, more or less appressed to inner bracts, later (after anthesis) more or less deflected to recurved, much wider than inner; dark green, more or less pinkish in the upper part, with rather narrow and indistinct scarious border, partly with small dark colored subterminal cornicle, partly without it; inner bracts from oblong-linear to oblong, one and one-half to two times as long as longest outer; green, with or without subterminal cornicles. Florets orange-yellow, more or less hairy in the middle part of corolla; peripheral florets with dark stripes on the lower side of ligules. Achenes light brown, body 2.5–3.0 mm long, with rather numerous longitudinal furrows, covered with tubercles almost from the base, tubercles longer and acute and with spinules in the upper part; cone 0.8–1.0 mm long; beak 8–12 mm long; pappus 7–8 mm long, white. Flowering April to May.

Gardens and parks, along roads, irrigation channels and inhabited areas.—*Soviet Central Asia*: Syr-Darya, Amu-Darya, Pamiro-Alai (western part). Endemic. Described from Tashkent. Type in Tashkent.

13. **T. praestans** Lindb. f. in Acta Soc. fauna et flora fennica XXIX, 9 (1908) 24; Markl. in Acta. bot. fennica XXIII (1938) 47.—**Exs.**: Eston. pl. No. 189.

Perennial. Plants 10–40 cm high, with rather thick root. Leaves 10–30 cm long and 2–4.5 cm wide, glabrous or subglabrous, green, runcinately pinnatipartite, with more or less deflexed lateral lobes, often toothed on anterior margin and smaller terminal lobe, with usually long-acuminate teeth between lobes. Scapes with more or less profuse arachnoid tomentum. Involucres 15–22 mm long, green; outer involucre bracts broadly lanceolate to lanceolate, usually slightly wider than inner bracts, partly appressed to them, partly more or less deflected from them to recurved, with very narrow scarious border, without cornicles; inner involucre bracts oblong-linear, one and one-half times or less as long as longest outer, more or less purple at the apex, without cornicles. Florets yellow, profusely long hairy in the middle part of corolla; peripheral florets with dark stripes on the lower side of ligules. Achenes light brown, body 3.5–4.0 mm long, with fewer, short, acute tubercles in the upper third, coalesced in transverse ridges, rather gradually terminated in about 0.5 mm long cone; beak of immature achene 6–8 mm long, later possibly elongating to 8–12 mm; pappus 7–8 mm long, white. Flowering June.

Meadows, forest glades and along roads.—*European Part*: Baltic Region. *General distribution*: Scandinavia. Described from Åland in Finland. Type in Helsinki.

- 440 14. **T. platycranum** Dahlst. in Kungl. Sv. Vet. Akad. Handl. ser. 3, VIII, 2 (1930) 225.—**lc.**: Dahlst. Ibid. fig. 14, 15.

Perennial. Plants 10–35 cm high, with rather thick root. Leaves 10–20 cm long and 2.5–4.5 cm wide, glabrous or subglabrous, green, runcinately pinnatifid, with more or less deflexed, rather wide, often toothed lateral lobes, four to eight on each side, and small but wide terminal lobe. Scapes slightly longer than leaves, with lax archnoid tomentum below capitula. Involucre 16–18 mm long at anthesis, very wide; outer involucral bracts ovate to broadly lanceolate, wider than inner bracts, membranous, light green, often more or less pinkish along margin and in upper part, with or without very short obtuse subterminal cornicles; inner bracts oblong-linear, often one and one-half times as long as longest outer, green, slightly ciliate in the upper part, without cornicles. Florets yellow, with long hairs in the middle part of corolla; peripheral florets with rather indistinct dark stripes on the lower side of ligules. Mature achenes not known. Flowering June.

Marshy meadows and gravel-beds along seacoast.—*Far East*: Kamchatka. Endemic. Described from vicinity of Petropavlovsk-on-Kamchatka. Type in Stockholm; isotype in Leningrad.

Subsection 2. Alpina Schischk. subsect. nova in Addenda XXVIII, 730.—*Taraxacum* sect. *Borealia* subsect. *Gymnophylla* ser. *Vulgari*. Hand.-Mazz. Monogr. Tarax. (1907) 73 p. p.—Medium or small alpine plants, with more or less thick root, flowering in July–August; root collar glabrous. Scape entirely glabrous, less often subglabrous. Involucral bracts without cornicles; outer bracts more or less numerous, appressed to inner, less often more or less deflected from them to recurved; inner bracts usually two times as long as longest outer bracts. Florets yellow. Achenes light brown; body 3.5–5.0 mm long, curved with acute tubercles in the lower part, rather abruptly, less often relatively gradually, terminated in 0.5–0.7 mm long cone; beak 5.5–8.0 mm long, always more than one and one-half times as long as body of achenes.

Type of subsection: *T. alpinum* Hegetschw. and Heer.

15. **T. nigricans** (Kit.) Rchb. Fl. Germ exc. (1830–1832) 270, p. p.; Hand.-Mazz. Monogr. Tarax. (1907) 101; Klokov in Vizn. Rosl. URSS, 593.—*Leontodon nigricans* Kit. in Schult. Oesterr. Fl. ed. 2, II (1814) 405.—*L. alpestre* Tausch in Flora IV, 2 (1821) 564.—*Taraxacum alpestre* (Tausch) DC. Prodr. VII (1838) 148.—**lc.**: Hand.-Mazz. op. cit. t. 3, fig. 5 and t. 5, fig. 3.

Perennial. Plants 10–40 cm high, with relatively slender root; root collar with fewer remnants of dead leaves, glabrous or subglabrous. leaves
 441 10–20 cm long and 1.5–5.0 cm wide, dull green, somewhat thick, glabrous, runcinately pinnatifid or pinnatilobate, with more or less deflexed, usually entire lateral segments or lobes and larger terminal lobe, less often undivided, more or less sinuate-toothed. Scapes longer than leaves, glabrous, less often with few hairs below capitula. Involucre 15–23 mm long, blackish, somewhat lustrous; outer involucre bracts broadly lanceolate to lanceolate, lax, appressed to inner bracts to recurved, almost as wide as inner bracts, usually without scarious border, without cornicles; inner bracts oblong-linear, usually two times as long as longest outer, without cornicles. Florets yellow; peripherals florets with brownish longitudinal stripes on the lower side of ligules. Achenes light brown; body about 4 mm long, with relatively short, acute tubercles in the upper third or fourth; cone 0.5–0.6 mm long; beak 6–8 mm long; pappus about 7 mm long, white. Flowering July to August.

Meadows of upper mountains zone.—*European Part*: Upper Dniester (Carpathians). *General distribution*: central Europe, Balkans. Described from Carpathians. Type in Budapest or Vienna.

16. **T. fontanum** Hand.-Mazz. Monogr. Tarax. (1907) 100; Klovov in Vozn. Rosl. URSR, 593.—*Ic.*: Hand.-Mazz. *ibid.*, t. 3, fig. 4 and t. 5, fig. 4.

Perennial. Plants 8–25 cm high, with rather thick root; root collar with fewer remnants of dead leaves, glabrous or subglabrous. Leaves light green, somewhat thickish, glabrous, 6–15 cm long and 1.5–4.5 cm wide, from undivided, remotely sinuate-toothed to pinnatilobate, with deflexed lateral lobes. Scapes solitary or few, usually entirely glabrous. Involucres 14–18 mm long, dark green, slightly glaucescent; outer involucre bracts broadly lanceolate to lanceolate, almost as wide as inner bracts, more or less appressed or separated from them, with narrow scarious border, without cornicles; inner bracts oblong-linear, two times as long as longest outer ones, also without cornicles. Florets yellow. Achenes light brown, their body 4–5 mm long, with rather numerous acute tubercles in the upper half; cone 0.5–0.7 mm long; beak 6–8 mm long; pappus 6–8 mm long, white. Flowering July to August.

Moist meadows, along banks of brooks and streams in upper mountain zone.—*European Part*: Upper Dniester (Carpathians). *General distribution*: central Europe, Mediterranean Region. Described from Alps. Type in Vienna.

17. **T. alpinum** Hegetschw. and Heer, Fl. Schweiz. (1840) 762; Hand.-Mazz. Monogr. Tarax. (1907) 94 p. p.; Klovov in Vozn. Rosl. URSR, 593.—*Leontodon alpinus* Hoppe in Sturm. Deutschl. Fl. V (1821) pag.

442 innum, non Stev. (1813).— **Ic.**: Hand.-Mazz. op. cit. t. 3, fig. 3 and t. 5, fig. 10; Hegi, Ill. Fl. VI, 2 (1929) fig. 774.— **Exs.**: Pl. Ital. exs. No. 1996

Perennial. Plants 5–20 cm high, with slender vertical root, root collar usually only with fewer remnants of dead leaves. Leaves numerous, glabrous, runcinately pinnatipartite or pinnatilobate, with larger terminal lobe. Scapes almost as long as leaves or longer, solitary or few, 8–15 mm long, dark green. Outer involucre bracts not firmly appressed to inner, wider than them, ovate to ovate-lanceolate, with more or less attenuate apical part, without cornicles; inner bracts oblong-linear, usually almost two times as long as longest outer ones, dark green, without cornicles. Florets yellow; peripheral florets with dark stripe on the lower side of ligule. Achenes light brown; body 3.5–4.5 mm long, with fewer and shorter acute tubercles in the upper third, rather gradually terminated at the apex in about 0.5 mm long cone; beak slender, 5.5–7.5 mm long; pappus 4–5 mm long, white. Flowering July to August.

Stony and rubbly slopes, lawns, in upper mountain zone.—*European Part*: Upper Dniester (Carpathians). *General distribution*: mountains of central and southern Europe. Described from Switzerland. Type apparently in Geneva.

Subsection 3. Spectabilia (Dahlst.) Schischk. comb. nova.—*Taraxacum* grex *Spectabilia* Dahlst. in Lindm. Svensk Fanerogamfl. ed. 2 (1926) 562.—*T.* grex *Calanthodia* Dahlst. in Acta Horti Gothoburg. II (1926) 144. —Rather large or medium plants of plains or lower mountains, less often alpine plants, with more or less thick root, flowering usually in June–August; root collar glabrous. Scape glabrous or with lax arachnoid tomentum below capitula. Involucre bracts without or with indistinct cornicles, outer bracts rather numerous, more or less appressed to inner bracts, latter one and one-half to two times as long as longest outer. Florets yellow, less often light yellow, usually with glabrous or subglabrous corolla. Achenes light brown, body 2.5–4.5 mm long, covered with acute tubercles in the upper part, rather abruptly terminated into 0.5–1.0 mm long cone; beak 6–12 mm long, always more than one and one-half, often more than two times as long as body of achenes.

Type of subsection: *T. spectabile* Dahlst.

Note. In this subsection, seemingly occupying an intermediate position between subsections *Vulgaris* and *Ceretophora*, I have combined two groups of species: the predominantly North European group *Spectabilia* Dahlst. and the predominantly East Asiatic group *Calanthodia* Dahlst., between which, in my opinion, there are no significant differences.

18. **T. platyepidum** Diels in Fedde, Repert. Beih. XII (1922) 545;
443 Dahlst. in Acta Horti Gothoburg. II (1926) 146; Kitam. in Mem. Coll.

Sc. Univ. Kyoto. ser. B, XXIV, 1 (1957) 15.—*T. otagirianum* Koidz. in Acta Phytotax. et Geobot. II (1933) 127.—*T. saxatile* Koidz. in Bot. Mag. Tokyo, XLVIII (1934) 594; Sugaw. Ill. Fl. Saghal. IV (1940) 1909.—*T. pruinatum* Koidz. op. cit. (1934) 596; Sugaw. op. cit. 1911.—*T. sachalinense* Koidz. op. cit. (1934) 597, non Kitam. (1933).—*T. koidzumii* Nemoto, Fl. Jap. Suppl. (1936) 826; Sugaw. op. cit. 1913.—*T. sugawarae* Koidz. op. cit. (1934) 588; Sugaw. op. cit. 1901.—**!C.**: Dahlst. op. cit. fig. 1 and t. 1, fig. 1–3; Sugaw. op. cit. t. 874, 878 and 880; Kitam. op. cit. fig. 2, 1, fig. 6, 1, fig. 11, 1.

Perennial. Plants with rather thick and long root. Leaves 10–40 cm long and 2–7 cm wide, more or less scatteredly hairy to subglabrous, obtuse or subobtuse, pinnatisect with more or less deflected lateral lobes, five to eight on each side, usually sinuate-toothed on anterior margin, and larger terminal lobe. Scapes many, more or less covered with lax arachnoid-hairy tomentum. Involucre 17–20 mm long; outer involucral bracts ovate to broadly lanceolate, more or less appressed to inner bracts, usually green, with darker veins and very narrow, scarious border, pinkish, and with short scattered hairs in the upper part, without cornicles; inner bracts oblong-linear, two times as long as longest outer ones, more or less blackish in the apical part, without cornicles. Florets yellow with glabrous corolla; peripheral florets with dark stripes on the lower side of ligules. Achenes light brown; body about 3.5 mm long, with rather numerous longitudinal furrows, covered with rather long, acute tubercles in the upper part; cone about 1 mm long; beak 10–12 mm long; pappus 8–9 mm long, whitish. Flowering June to August.

Meadows, herb slopes, roadsides and inhabited areas—*Far East*: Ussuri, Sakhalin. *General distribution*: northwestern China, Korean Peninsula, Japan. Described from China. Type in Berlin.

Note. Species cited by me in synonymy are described from Sakhalin Island and, according to Kitamura (op. cit.), are without any doubt synonyms of this species.

19. **T. ohwianum** Kitam. in Acta Phytotax. et Geobot. II (1933) 124 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 38.—*T. mandshuricum* Nakai ex Koidz. in Bot. Mag. Tokyo, L (1936) 89.—**!C.**: Kitam. op. cit. (1957) fig. 4. 1 and fig. 12, 4.

Perennial. Plants with rather thick and long root. Leaves 9–20 cm long and 2–5 cm wide, sparsely hairy on both surfaces, green, pinnatipartite or pinnatilobate, with more or less deflexed lateral lobes or lobules, four or five on each side, often toothed on anterior margin, and small terminal lobe, usually more or less toothed between lobes. Scapes many, scatteredly hairy with loose tomentum below capitula. Involucre 13–15 mm long at anthesis, 15–20 mm at fruiting, green; outer involucral

bracts broadly lanceolate to lanceolate-ovate, more or less appressed to inner bracts, with indistinct scarious border and occasional flexuous hairs, more or less pinkish in the upper part, without cornicles or with indistinct cornicles; inner bracts oblong linear, two to two and one-half times as long as longest outer bracts, dark purple below apex, without cornicles. Florets yellow, with weakly hairy or glabrous corolla, peripheral florets with wide dark stripe on lower side of ligules. Achenes light brown; body 3.0–3.5 mm long, with numerous longitudinal furrows, covered with acute tubercles in the upper part; cone 0.5–1.0 mm long; beak 8–12 mm long; pappus 7–8 mm long, whitish. Flowering May to June.

Meadows and herb slopes.—*Far East*: Ussuri, Zeya-Bureya. *General distribution*: Korean Peninsula, northeastern China. Described from Korean Peninsula. Type in Kyoto.

20. **T. coreanum** Nakai in Bot. Mag. Tokyo, XLVI (1932) 62 and Fl. Sylv. Kor. XIV (1923) 123, nom. nud.; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B. XXIV, 1 (1957) 39.—*Ic.*: Kitam. ibid. fig. 7, 4 and fig. 12, 6.

Perennial. Plants with rather thick, sometimes many-headed root. Leaves 7–25 cm long and 1.4–6.0 wide, scatteredly hairy on both surfaces, green, runcinately pinnatipartite with more or less deflexed, often more or less toothed, lateral lobes, five or six on each side, and small terminal lobe. Scapes with rather profuse arachnoid-hairy tomentum below capitula. Involucres 15–18 mm long at anthesis, 17–21 mm long after anthesis, green; outer involucral bracts broadly lanceolate to lanceolate, more or less deflected from inner (to recurved), with very narrow scarious border and often more or less pinkish in the upper part, usually with small subterminal cornicles; inner bracts oblong-linear, black-purple at the apex, without or with small cornicle. Florets whitish, less often yellowish-white, with glabrous corolla; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body 3.5 mm long with rather numerous furrows, entirely covered with tubercles; tubercles acute and longer in upper part and short and obtuse in lower part; cone about 1 mm long; beak 8–9 mm long; pappus 7–8 mm long, whitish. Flowering May to June.

Meadows, herb slopes, roadsides.—*Far East*: may be found in Ussuri. *General distribution*: Korean Peninsula, northeastern China. Described from Korean Peninsula. Type in Tokyo.

21. **T. mexicanum** DC. Prodr. VII (1838) 146; Hand.-Mazz. Monogr. Tarax. (1907) 75 and 168; Kom. and Alis. Oprel. Rast. Dalnevost. Kr. II, 1092.—*Ic.*: Hand.-Mazz. op. cit. t. 2, fig. 17.

445 Perennial. Plants 12–20 cm high, with rather thick, often many-headed

root; root collar with fewer remnants of dead leaves, more or less hairy in their axils. Leaves 10–25 cm long and 2–5 cm wide, numerous, more or less scatteredly hairy on both surfaces, runcinately pinnatipartite, with more or less deflexed lateral lobes entire or toothed on anterior margin, and usually larger terminal lobe. Scapes with more or less profuse lax arachnoid-hairy tomentum below capitula. Involucre 13–16 mm long; outer involucre bracts broadly lanceolate to lanceolate, more or less appressed to inner bracts and almost as wide, with rather narrow scarious border, attenuated in the upper part into narrow and long tip, without or with indistinct cornicles; inner bracts oblong-linear, usually one and one-half to two times as long as longest outer bracts, without or with short and inconspicuous cornicles at the apex. Florets yellow? Achenes light brown; body 2.5–3.0 mm long with rather numerous longitudinal furrows, covered with acute tubercles in the upper third; beak 6.5–7.5 mm long; pappus about 7 mm long, white. Flowering July to August.

Sands and gravels along seacoasts, roadsides.—*Far East*: Ussuri. *General distribution*: Mexico. Described from Mexico. Type in Geneva.

Note. The monograph of the genus (Handel-Mazzetti, op. cit. 168) assigns to this species several specimens from the Far East, despite a large gap in the distribution area. Apparently, they belong more likely either to an as yet undescribed new species or to one of the several species of *Taraxacum* described from East Asia by Japanese authors.

22. **T. ussuriense** Kom. in Izv. Bot. Sada, Akad. Nauk SSSR, XXX (1932) 220; Kom. and Alis. Opređ. Rast. Dalnevost. Kr. II (1932) 1092.—**Ic.:** Kom. and Alis. *ibid.* Plate 329.

Perennial. Plants 8–25 cm high, with rather thick, often many-headed root. Leaves 8–20 cm long and 1.0–2.8 cm wide, glabrous or subglabrous, green, gradually narrowed toward base into narrowly winged petiole; outer leaves in rosette usually undivided, more or less sinuate-toothed; inner (sometimes only few) pinnatilobate or pinnatipartite with entire or subentire, subacute lateral segments or lobes. Scapes many, entirely glabrous. Involucres 12–17 mm long, green; involucre bracts dark in the upper part, without cornicles; outer bracts lanceolate-ovate to broadly lanceolate, appressed to inner bracts and somewhat wider, with narrow, scarious border; inner bracts oblong-linear, two times as long as longest outer bracts. Florets yellow, corolla glabrous, peripheral florets with dark brown stripe on lower side of ligules. Achenes light brown; body 3.5
446 mm long, with fewer longitudinal ridges, covered with acute tubercles in the upper half, only with a few obtuse tubercles below; cone 0.6–0.8 mm long; beak 6–8 mm long; pappus about 7 mm long, white. Flowering May to June.

Meadows, forest glades, roadsides, sometimes at edge of fields.—



Far East: Ussuri. Endemic(?). Described from Pacific Coastal Region (Suputinka River basin). Type in Leningrad.

23. **T. neo-sachalinense** Koidz. in Journ. Jap. Bot. XII (1936) 619; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 6.—**!c.**: Sugawara, Ill. Fl. Saghal. IV (1940), t. 882.

Perennial. Plants with long vertical root; root collar covered with remnants of dead leaves. Leaves 10–14 cm long and 15–30 cm wide, sparsely hairy on both surfaces, deeply pinnatipartite, with rather wide, slightly deflexed, lateral lobes, five to seven on each side and more or less toothed in the basal part, ciliate-toothed between lobes; terminal lobe small, obtuse. Scapes several, at anthesis longer than leaves, with more or less dense arachnoid tomentum below capitula. Involucre about 18 mm long after anthesis, dark green, outer involucre bracts oblong, less often puberulent, with narrow scarious border, whitish, without or with indistinct cornicles; inner involucre bracts oblong-linear, two times as long as longest outer, blackish at the apex, without or with indistinct cornicles. Florets yellow (?). Achenes light brown; body about 3 mm long, covered with shorter acute tubercles in the upper part; cone about 0.7 mm long; beak 10.0–11.5 mm long; pappus 7 mm long, whitish. Flowering June to July.

Meadows, herb slopes and roadsides.—*Far East*: Sakhalin. Endemic. Described from Sakhalin. Type in Kyoto.

24. **T. tatewakii** Kitam. in Acta Phytotax. et Geobot. XI (1942) 266 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 13.—**!c.**: Kitam. *ibid.* (1957) fig. 2, 5.

Perennial. Plants with rather thick root; root collar covered with numerous dark brown remnants of dead leaves. Leaves 4.5–12.0 cm long and 1–2 cm wide, somewhat thickish, scatteredly hairy to glabrous, obtuse, usually undivided, sinuate-toothed, outer leaves in rosette sometimes pinnatilobate. Scapes usually longer than leaves at anthesis, with lax arachnoid tomentum below capitula. Involucre 15–16 mm long at anthesis, 16–18 mm long after anthesis, dark green; outer involucre bracts ovate to lanceolate-ovate, without or with indistinct cornicles, with scarious border; inner bracts oblong-linear (often coalescent), two times as long as longest outer bracts, blackish in the upper part, without cornicles. Florets yellow, with subglabrous or glabrous corolla, with dark stripes on lower side of ligules. Achenes brownish; body about 4.5 mm long, with numerous longitudinal furrows, covered with acute tubercles in the upper part; cone 0.5–0.6 mm long; beak 7–8 mm long; pappus 7–8 long, white. Flowering June to August.

Meadows and herb slopes.—*Far East*: Sakhalin. Endemic Described from Sakhalin. Type in Sapporo.

25. **T. natschikense** Kom. Fl. Kavk. III (1930) 199.

Perennial. Plants with rather thick, often many-headed root; root collar with rather numerous dark brown remnants of dead leaves. Leaves 7–18 cm long and 1.5–4.0 cm wide, on broad-winged petioles, glabrous or subglabrous, undivided, sinuate-toothed. Scapes to 20 cm long, with more or less dense arachnoid tomentum only below capitula. Involucres 14–17 mm long, dark green; involucre bracts without cornicles, less often with indistinct cornicles; outer bracts ovate to broadly lanceolate, more or less appressed to inner bracts and somewhat wider than them, with very narrow membranous border; inner oblong-linear, usually two times as long as longest outer ones. Florets yellow, peripheral florets almost without dark stripes on the lower side of ligules. Mature achenes not known. Flowering July to August.

Mountain meadows.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (valley of Poperechnaya River near village of Nachik). Type in Leningrad.

26. **T. pseudoglabrum** Dahlst. apud Hult. in Kungl. Sc. Vet. Akad. Handl. VIII, 2 (1930) 225.—*lc.*: Dahlst. *ibid.* fig. 16.

Perennial. Leaves glabrous or subglabrous, 5–10 cm long and 20–25 cm wide, from undivided, sinuate-toothed to pinnatilobate, with wider lobes. Scapes much longer than leaves, with weak arachnoid pubescence below capitula, subglabrous. Involucre medium, dark green; outer involucre bracts broadly ovate to ovate-lanceolate, with very narrow scarious border, more or less appressed to inner bracts; inner bracts oblong-linear, as also outer, without or with indistinct cornicles. Florets light yellow; peripheral florets with almost monochromatic ligules. Achenes more or less reddish-brown, body about 4 mm long, with fewer and shorter acute tubercles in the upper part, rather gradually terminating in about 0.75 mm long cone; beak about 10 mm long; pappus about 6 mm long, white. Flowering August to September.

449 Meadows, stony slopes in upper mountain zone.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (Klyuchevsk volcano). Type in Stockholm.

Note. With respect to the structure of the achene body, this species is very close to species of section *Laevia*, but has a much longer beak.

27. **T. pseudoalpinum** Schischk. sp. nova in addenda XXVIII, 730; Kovalevskaya in Fl. Uzb. VI (1962) 47, Diagn. in Russia.—*T. alpinum* auct. non Hegetschw. and Heer: Hand.-Mazz. Monogr. Tarax. (1907) 94 p. p.

Perennial. Plants 10–25 cm high, with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves,

glabrous. Leaves 6–20 cm long and 1–4 cm wide, glabrous, green, from undivided, sinuate-toothed with rather large teeth to pinnatilobate with more or less deflexed, usually entire, lateral lobes and larger but narrow terminal lobe. Scapes glabrous or weakly arachnoid pubescent below capitula. Involucres 12–16 mm long, dark green; outer involucral bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts, somewhat wider than or almost as wide as them, almost without scarious border, without cornicles; inner bracts oblong-linear and one and one-half to two times as long as longest outer bracts, without or with indistinct cornicles. Florets yellow, corolla weakly hairy in middle part, peripheral florets with dark stripes on lower side of ligules. Achenes light yellowish-brown; body 3.0–3.5 mm long, covered with acute tubercles in the upper part; cone 0.8–1.0 mm long; beak 7–9 mm long; pappus 6–7 mm long, white. Flowering July to August.

Meadows, stony slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Tien Shan, Pamiro-Alai. Endemic (?). Described from Tien Shan. Type (valley of Kokpaka River, about 2,500 m, No. 16, V. Stscheglova) in Leningrad.

Note. It is a polymorphic species, which, apparently, has split into several ecogeographic races with more restricted ranges.

28. **T. schischkinii** V. Korol. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VIII, 6 (1940) 93.—**lc.**: V. Koroleva, *ibid*, Fig. 4.

Perennial. Leaves runcinately pinnatilobate or pinnatipartite with larger terminal lobe and fewer lateral lobes; lateral lobes more or less toothed or entire. Scapes usually several. Involucres 12–15 mm long, glaucescent-green; outer involucral bracts ovate to broadly lanceolate, appressed to inner bracts and slightly wider than them, without cornicles; inner bracts oblong-linear, usually one and one-half times as long as longest outer, 450 without cornicles. Florets yellow, with darker grayish-violet. stripe on lower side of ligules. Achenes light brown; body 3.2–3.6 mm long, with fewer acute tubercles in the upper one-fourth to one-fifth; cone 0.6–0.8 mm long; beak 8.5–10.0 mm long; pappus 6–7 mm long, white. Flowering July.

Alkaline meadows.—*Soviet Central Asia*: Tien Shan (eastern part), Dzhungaria-Tarbagatai. *General distribution*: probably found in bordering regions of China. Described from valley of Tekes River. Type in Leningrad (herbarium of the All-Union Institute of Plant Industry).

Note. It is one of the dandelions that in the past has infested crops of "Kok-Sagyz."

29. **T. croceum** Dahlst. apud Anderss. and Hessel. in Bihang till Kungl. Sv. Vet. Akad. Handl. XXVI, III, No. 1 (1900) 12; Dahlst. in Kungl. Sv. Vet. Akad. Handl. IX, 2 (1930) 78; Schischk. in Kryl. Fl.

Zap. Sib. XI, 3006. —*T. lapponicum* auct. non Kihlm.: Hand.-Mazz. Monogr. Tarax. (1907) 73, p. p.—**lc.**: Dahlst. op. cit. (1930) fig. 27, t. 3, fig. 5–7.

Perennial. plants with rather thick root; root collar covered with dark brown remnants of dead leaves. Leaves green, glabrous or subglabrous, 5–20 cm long and 1–3 cm wide, runcinately pinnatifid or pinnatilobate, usually with intermediate lobules or teeth; lateral segments or lobes narrow-deltoid to lanceolate, often slightly deflexed; terminal lobe much larger than lateral, acute or subacute. Scapes slightly longer than leaves or almost as long, with weak arachnoid pubescence below capitula or glabrous. Involucres medium, olive green; outer involucral bracts lanceolate-ovate to broadly lanceolate, loosely appressed to inner bracts and slightly wider than them, more or less violet at the apex; inner bracts oblong-linear, tinged purple at the apex; all florets without cornicles. Florets saffron-yellow, peripheral ones with darker stripes on the lower side of ligules. Achenes light brown; body 3.5–4.5 mm long, with rather numerous acute tubercles in the upper half; cone 0.5–0.7 mm long; beak 7–9 mm long; pappus 6–7 mm long, white. Flowering July to August.

Meadows, herb slopes.—*Arctic*: ?Arctic Europe. ?Novaya Zemlya, Arctic siberia (? western Part) *Western Siberia*: ?Altai. *General distribution*: Arctic Scandinavia, Spitsbergen, Iceland, Greenland, Canada (northeastern part). Described from Spitsbergen. Type in Stockholm.

Note. This species was reported, apparently erroneously, for arctic regions of the USSR and Altai, in place of *T. lapponicum*. It may be found in Novaya Zemlya and Kola Peninsula.

30. ***T. lapponicum*** Kihlm. ex. Hand.-Mazz. Monogr. Tarax. (1907) 7, p. p.; Kihlm. in Meddel. Soc. pro fauna et. flora fennica, XI (1884) 63, pro var. *T. officinalis*, nom. provis.; Kom and Alis. Opred. Rast. Dalnevost. Kr. II, 1092; Karavaev, Konsp. Fl. Yakut. (1958) 177.

451 Perennial. Plants 5–25 cm high, with rather thick, ascending or vertical, root; collar covered with brownish remnants of dead leaves, usually with weak, not always noticeable, pubescence of long flexuous hairs in their axils. Leaves 5–20 cm long and 1–3 cm wide, on short broad-winged petioles, glabrous, usually runcinately pinnatipartite or pinnatilobate, with more or less deflexed, entire, less often more or less toothed, lateral segments or lobes, and rather large terminal lobe, often with long-acuminate teeth between lobes, less often undivided, with remote large teeth. Scapes glabrous or with fewer flexuous hairs below capitula. Involucres 12–16 mm long, dark green; involucral bracts without cornicles; outer bracts lanceolate-ovate or broadly lanceolate, long-acuminate, more or less appressed to inner bracts (but often recurved in fruits), almost as wide or slightly wider than them, often somewhat glaucescent, with very

narrow scarious border; inner bracts oblong-linear, usually one and one-half times as long as longest outer bracts. Florets yellow, with subglabrous corolla; peripheral florets with dark stripes on the lower side of ligules. Achenes light yellowish-brown; body 4.0–4.5 mm long, covered with acute tubercles in the upper third, often fewer and coalesced in transverse ridges; cone 0.6–0.8 mm long; beak 6–9 mm long; pappus about 7 mm long, white. Flowering July to August.

Meadows, gravel-beds along banks of reservoirs, sandy and stony slopes.—*Arctic*: all regions; *European part*: Karelia-Lapland (northern part), Dvina-Pechora (northern part); *Western Siberia*: Ob' River area (northern part); *Eastern Siberia*: Lena-Kolyma; ?*Far East*: Okhotsk, Uda Region, Zeya-Bureya. *General distribution*: Scandinavia, Spitsbergen. Described from northern Finland. Type in Helsinki.

Note. Possibly, this species is a later synonym of *T. croceum* Dahlst. Reports of *T. lapponicum* from eastern Siberia and the Far East need to be confirmed on the basis of more extensive material.

31. ***T. sagittifolium*** Lindb. f. ex Dahlst. in Kungl. Sv. Vet. Akad. Handl. IX, 2 (1930) 74. —**lc.**: Dahlst. *ibid*, fig. 25 and t. 3, fig. 2.

Perennial. Plants with rather thick root. Leaves 10–20 cm long and 2–5 cm wide, light green, subglabrous, runcinately pinnatifid, with more or less deflexed lateral lobes, sometimes with dentate anterior margin, three to five on each side, and somewhat larger terminal lobe, irregularly toothed between lobes. Scapes usually longer than leaves, weakly arachnoid pubescent below capitula. Involucres rather large, olive green; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts, more or less purple-violet in the upper part, without scarious border and cornicle; inner bracts oblong-linear, also without cornicle. Florets yellow; peripheral ones with dark stripes on the lower side of ligules. Achene light brown, body 4.0–4.3 mm long, 452 with a few longitudinal furrows, covered with acute tubercles in the upper half or third; cone 0.7–0.8 mm long; beak 7–8 mm long; pappus 6–8 mm long, white. Flowering July to August.

Meadows, herb slopes, gravel-beds. —*Arctic*: Arctic Europe (western part); *European Part*: Karelia-Lapland (Kola Peninsula). *General distribution*: Scandinavia. Described from Finland. Type in Stockholm.

Subsection 4. *Ceratophora* Hand.-Mazz. Monogr. Tarax (1907) 58 p. p.—*Taraxacum* grex *Ceratophora* Dahlst. in Lindm. Svensk. Fanerogmf. ed. 2 (1926) 562.—Rather large or medium, less often small plants, usually growing in plains and lower mountains, less often (in more southern regions) alpine plants with more or less thick root; flowering in June–August; root collar glabrous. Scapes arachnoid-tomentose below

capitula, less often entirely glabrous. Involucral bracts (sometimes only outer or only inner) with more or less large subterminal cornicles outer bracts usually numerous, more or less appressed to inner bracts, less often deflected from them to deflexed; inner bracts one and one-half to two and one-half times as long as longest outer bracts. Florets yellow. Achenes light brown; body 2.5–5.5 mm long, with rather numerous acute tubercles in the upper half or third, rather abruptly terminating into 0.3–1.5 mm long cone; beak 6–13 mm long, always more than one and one-half times, usually more than two times as long as body of achenes.

Type of subsection : *T. ceratophorum* (Ldb.) DC.

32. ***T. chirieanum*** Kitam. in Acta Phytotax. et Geobot. XI (1942) 267 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, I (1957) 16.—**lc.**: Kitam. op. cit. (1942) t. 1, fig. 1.

Perennial. Plants with rather thick long root; root collar covered with fewer brownish remnants of dead leaves. Leaves 15–40 cm long and 2–3 cm wide, undivided, irregularly toothed, weakly pubescent, later subglabrous. Scapes many, longer than leaves, with lax arachnoid tomentum below capitula. Involucre 16–20 mm long, dark green; outer involucral bracts broadly lanceolate to lanceolate, appressed to inner bracts, with narrow scarious border, with long (2.5–4.0 mm long) subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with well-developed subterminal cornicle. Florets yellow(?). Achenes light brown; body about 4.5 mm long, covered with acute tubercles in the apical half, only with short obtuse tubercles below; cone 0.5–1.0 mm long; beak about 12 mm long; pappus 8–10 mm long whitish. Flowering July.

Meadows, gravel-beds roadsides.—*Far East*: Sakhalin. Endemic. Described from Sakhalin. Type in Kyoto.

453 33. ***T. pseudolasianthum*** Koidz. in Bot. Mag. Tokyo, XLVIII (1934) 592; Kitam, in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 12.—**lc.**: Sugaw. Ill. Fl. Saghal. IV (1940) t. 876; Kitam. op. cit. fig. 2, 4.

Perennial. Plants with rather thick root; root collar covered with numerous dark brown remnants of dead leaves. Leaves 10–25 cm long and 1.5–4.0 cm wide, somewhat thickish, glabrous or subglabrous, usually undivided, more or less sinuate-toothed, less often partly pinnatilobate. Scapes many, with lax arachnoid-hairy tomentum below capitulum. Involucres 15–16 mm long at flowering time, 16–18 mm long after anthesis, dark green; outer involucral bracts appressed to inner bracts or deflected but not recurved, broadly lanceolate to lanceolate, with or without small subterminal cornicles, whitish-green along margin; inner bracts oblong-linear, usually about two times as long as longest outer bracts,

with or without small subterminal cornicles, more or less reddish in the upper part. Florets yellow, corolla scatteredly hairy in middle part; peripheral florets without dark stripes on the lower side of ligules. Achenes brownish, body 5.0–5.5 mm long, with numerous furrows, covered with acute tubercles in the upper part; cone 0.7–1.0 long; beak 8–10 mm long; pappus about 8 mm long, whitish. Flowering July.

Herb slopes and meadows.—*Far East*: Sakhalin. Endemic. Described from Sakhalin. Type in Kyoto.

34. **T. nairoense** Koidz. in Bot. Mag. Tokyo XLVIII (1934) 593; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 11.

Perennial. Plants with rather thick, often many-headed root; root collar with fewer remnants of dead leaves. Leaves 10–35 cm long and 3.5–8.0 cm wide, scatteredly hairy on both surfaces, later often subglabrous, pinnatilobate to deeply pinnatifid, with more or less deflexed lateral segments or lobes, seven to nine on each side, more or less sinuate-toothed between lobes. Scapes many, with profuse lax whitish tomentum below capitula. Involucres 17–20 mm long at flowering time, 20–25 mm long at fruiting; outer involucral bracts ovate-oblong, more or less deflected from inner to recurved, with narrow scarious border, with small but distinct subterminal cornicle; inner involucral bracts oblong-linear, usually one and one-half times as long as longest outer bracts, with small subterminal cornicle. Florets yellow; peripheral with wide dark stripes on the lower side of ligules. Achenes light brown, body 3.5 mm long, with three deep furrows and many ribs, covered with acute tubercles in the upper part; cone 1.5–1.8 mm long; beak about 11 mm long; pappus about 7 mm long, white. Flowering June to July.

454 Meadows, herb slopes.—*Far East*: Sakhalin. Endemic. Described from Sakhalin. Type in Tokyo.

35. **T. grandisquamatum** Koidz. in Journ. Jap. Bot. XII (1936) 618; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV 1 (1957) 5.— **lc.**: Sugaw. Ill. Fl. Saghal. IV (1940) t. 881.

Perennial. Plants with rather thick root and root collar covered with rather numerous brownish remnants of dead leaves. Leaves 13–18 cm long and 2.5–3.0 cm wide, less often arachnoid-hairy or glabrous, undivided, remotely sinuate-toothed or pinnatilobate, without intermediate teeth between teeth and lobes. Scapes many, longer than leaves at anthesis, more or less arachnoid-hairy tomentose below capitula. involucres 14–17 mm long after flowering, sometimes with a few bracteal leaves at the base longer than involucre; outer involucral bracts lanceolate-ovate, to oblong, without scarious border but usually scatteredly ciliate, dark green, with small (1–2 mm long), subterminal cornicles; inner bracts oblong-linear, blackish at the apex, scatteredly short hairy, usually one and one-half

times as long as longest outer bracts and with short subterminal cornicles. Florets yellow? Achenes light yellowish-brown; body about 4 mm long, in the upper part with acute tubercles; cone about 1 mm long; beak 12–13 mm long; pappus 9–11 mm long, whitish. Flowering June to July.

Meadows.—*Far East*: Sakhalin. Endemic. Described from Sakhalin. Type in Kyoto.

36. **T. miyakei** Kitam. in Acta Phytotax. et. Geobot. IX (1942) 267 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 4.

Perennial. Plants with rather thick root, root collar covered with rather numerous brownish remnants of dead leaves. Leaves 10–16 cm long and 2.0–2.8 cm wide, glabrous, usually undivided, irregularly sinuate-toothed, less often pinnatilobate. Scapes many, almost as long as leaves at anthesis, with fairly profuse acrahnoid hairy tomentum below capitula, with sparse arachnoid pubescence below. Involucre 14–15 mm long; outer involucre bracts oblong-lanceolate or oblong, more or less deflected from inner bracts, dark green, with narrow scarious border, and rather long (1.5–3.0 mm), subterminal cornicle; inner involucre bracts oblong-linear, usually one and one-half times as long as longest outer bracts, with small subterminal cornicle. Florets yellow, with brownish stripes on the lower side of ligules; corolla with scattered short hairs in the middle part. Achenes not known. Flowering June to July.

Meadows, herb slopes, gravel-beds.—*Far East*: Sakhalin. Endemic. Described from Sakhalin. Type in Kyoto.

455 37. **T. sachalinense** Kitam. in Acta Phytotax. et Geobot. II (1933) 121.— *T. trigonolobum* f. *sachalinense* Koidz. in Bot. Mag. Tokyo, XLVIII (1934) 588.

Perennial. Plants with rather thick, sometimes many-headed root; root collar covered with numerous blackish-brown remnants of dead leaves. Leaves 7–15 cm long and 10–16 mm wide, attenuated into narrow-winged petiole, glabrous or with weak arachnoid pubescence on the lower surface, undivided, usually remotely toothed, with teeth changing into short lobes, less often pinnatilobate with deltoid, slightly deflexed lobes. Scapes solitary or few, usually slightly longer than leaves, more or less densely arachnoid-hairy tomentose below capitula. Involucre 12–15 mm long, dark green; outer involucre bracts mostly oblong, basally appressed to inner bracts, ciliate, often with short (to 2 mm long), obtuse subterminal cornicle; inner involucre bracts oblong-linear, with short cornicle almost at the apex. Florets yellow with glabrous corolla. Achenes not known. Flowering June to August.

Meadows, stony slopes in mountain regions.—*Far East*: ?Ussuri, Sakhalin. *General distribution*: northeastern China, Korean Peninsula. Described from Sakhalin. Type in Kyoto.

38. **T. shikotanense** Kitam. in Acta Phytotax. et Geobot. II (III 1933) 126 and in Mem. Coll. Sc. Univ. Kyoto ser. B., XXIV, 1 (1957) 11.—*T. yezoense* Koidz. in Journ. Jap. Bot. IX (X 1933) 360 and in Kyozei-Koza, VI, 9 (1930) 14, nom. nud.—**lc.**: Kitam. op. cit. (1957) fig. 3, 1.

Perennial. Plants with rather thick root; root collar covered with rather numerous remnants of dead leaves. Leaves 15–30 cm long and 2.5–6.0 cm wide, obtuse or subacute, narrowed at the base into broad-winged petiole, pinnatipartite into deltoid, subobtusely lateral lobes, four to six on each side, with more or less toothed anterior margin, and larger terminal lobe, usually with small teeth or scattered hairs to subglabrous between lobes. Scapes fewer, scatteredly arachnoid-hairy with rather profuse lax arachnoid tomentum below capitula. Involucre 17–20 mm long at anthesis, 20–27 mm long after flowering, dark green; outer involucre bracts more or less appressed to inner bracts, ovate-lanceolate to broadly lanceolate, with narrow scarious border and scattered hairs, with well developed, to 1.0–1.5 mm long, subterminal cornicle, blackish in the upper part; inner involucre bracts oblong-linear, usually one and one-half times as long as longest outer bracts, blackish-purple in the apical part, with short cornicle. Florets yellow, sparsely hairy in the middle part of corolla; peripheral florets with dark stripes in lower side of ligules. Achenes light brown; 456 body 4–5 mm long, covered with acute tubercles in the upper half; cone about 1 mm long; beak 11–13 mm long; pappus 7.0–9.5 mm long, whitish. Flowering June to July.

Meadows, sands and gravels of seacoasts.—*Far East*: Sakhalin (Kuril Islands). *General distribution*: Japan. Described from Shikotan. Type in Kyoto.

39. **T. ketoense** Tatew. and Kitam. in Acta Phytotax. et Geobot. III (1934) 106; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, I (1957) 14.

Perennial. Plants with long and thick root. Leaves 16–20 cm long and 3–4 cm wide, acute or subacute, gradually narrowed into long petiole, glabrous; pinnatipartite, with more or less deflexed, often toothed, lateral lobes and rather large terminal lobe. Scapes several, usually almost two times as long as leaves, subglabrous. Involucres 18–22 mm long, dark green; outer involucre bracts ovate-lanceolate to broadly lanceolate, sometimes with small teeth, almost without scarious border, often pinkish in the upper part, often with small subterminal cornicle; inner involucre bracts oblong-linear, two times as long as longest outer bracts, with small subterminal cornicle. Florets yellow, with glabrous corolla; ligules of peripheral florets almost isochromous on both surfaces. Achene light brown; body about 4 mm long, with acute tubercles in the upper part;

cone 1.0–1.5 mm long; beak about 11 mm long; pappus about 9 mm long, whitish. Flowering July.

Meadows, herb slopes.—*Far East*: Kuril Islands. Endemic. Described from Kuril Islands (Keto Island). Type in Sapporo.

40. ***T. yetrofuense*** Kitam. in Acta Phytotax. et Geobot. II (IX 1933) 184 and in Mem. Coll. Sci. Univ. Kyoto, ser. B, XXIV, 1 (1957) 27.—*T. giganteum* Koidz. in Journ. Jap. Bot. IX (X 1933) 362 and X (1934) 142. —? *T. vegetum* Koidz. ibid. (X 1933) 361 and (1934) 73.—? *T. longifolium* Koidz. ibid. (X 1933) and (1934) 146. — **lc.**: Koidz. op. cit.

Perennial. Plants with rather thick long root. Leaves 10–25 cm long and 3–6 cm wide, scatteredly hairy on both surfaces, deeply pinnatifid with deflexed, often large-toothed lateral lobes, four to six on each side, and small terminal lobe, irregularly toothed between lobes. Scapes few, with rather profuse arachnoid tomentum below capitula. Involucres 16–17 mm long at flowering time, 17–22 mm long with fruits, green, outer involucral bracts oblong-lanceolate to lanceolate, usually more or less deflected from inner bracts (to recurved), with narrow scarious border, with small subterminal cornicle; inner bracts linear-lanceolate, two times, less often one and one-half times as long as longest outer bracts, dark colored in the upper part, usually with small subterminal cornicle. Florets
457 yellow, scatteredly short hairy in the upper part of corolla; peripheral florets with wide dark stripes on the lower side. Achenes light yellowish-brown; body about 3.5 mm long, covered with acute tubercles in the upper half, only with obtuse-tubercles below; cone 1.0–1.2 mm long; beak 10–13 mm long; pappus about 8 mm long, whitish.

Grassy areas, herb slopes.—*Far East*: Kuril Islands. Endemic. Described from Kuril Islands. Type in Kyoto.

Note. S. Kitamura (op. cit. 1957) considers *T. giganteum* Koidz. as a synonym of this species and, although doubtful, includes the species *T. vegetum* Koidz. and *T. longifolium* Koidz. All these species are described from the Kuril Islands.

41. ***T. shimushirens*** Tatew. and Kitam. in Acta Phytotax. et Geobot. III (1934) 105; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 7.

Perennial. Plants medium with slender long root; root collar covered with blackish-brown remnants of dead leaves. Leaves 8–11 cm long and 2.3–3.0 cm wide, scatteredly hairy to glabrous, obtuse, large sinuate-toothed or pinnatifid; lateral teeth and lobes usually more or less deflexed, often with small teeth, terminal lobe large, round-deltoid. Scapes longer than leaves after flowering; scatteredly arachnoid-hairy, later subglabrous. Involucres 18–20 mm long after anthesis; outer involucral bracts mostly wide, oblong, less often lanceolate, with narrow scarious

border, ciliolate, with small pinkish, subterminal cornicle; inner bracts oblong-linear, usually two and one-half to three times as long as longest outer bracts, with scarious border, and small blackish subterminal cornicle. Florets yellow (?). Achenes light yellowish-brown; body about 4 mm long, with acute tubercles at the apex; cone about 1 mm long; beak about 10 mm long; pappus 7–8 mm long, whitish. Flowering June to July.

Meadows, herb slopes.—*Far East*: Kuril Islands. Endemic. Described from Shimushir Island. Type in Sapporo.

42. **T. shumushuense** Kitam. in Acta Phytotax. et Geobot. II (1933) 124 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 8.—*T. pseudotrigonolobum* Koidz. in Journ. Jap Bot. XI (1935) 474. —*T. brevisquamum* Koidz. ibid. 472. —*T. frigidopratense* Koidz. ibid. 475. —**!c.**: kitam op. cit. (1957) fig. 1, 2.

458 Perennial. Plants with long, rather thick root; collar covered with brownish remnants of dead leaves. Leaves thickish, 5–20 cm long, obtuse, usually with short cusp, attenuate at the base in short-winged petiole, pinnatilobate with irregularly toothed or entire lateral lobes, three to five on each side, and larger terminal lobe scatteredly hairy on both surfaces or subglabrous. Scapes few, with profuse arachnoid pubescence up to anthesis, later subglabrous, but with lax arachnoid tomentum below capitula. Involucres 15–16 mm long at flowering time, dark green; outer involucral bracts broadly ovate to lanceolate-ovate, appressed to inner bracts, with very narrow scarious border, sparsely hairy on outer surface, with or without small subterminal cornicle; inner bracts oblong-linear, three times as long as longest outer bracts, glabrous or sparsely hairy, more or less pinkish in the upper part or without small cornicles. Florets yellow, peripheral florets with dark stripes on lower side of ligules, cololla glabrous. Achenes brownish; body about 3.5–4.0 mm long, with acute tubercles in the upper third; cone about 1 mm long; beak about 9 mm long; pappus about 7 mm long, whitish. Flowering June to August.

Meadows, herb slopes.—*Far East*: Kuril Islands (Shumshu and Paramushir islands). Endemic. Described from Shumshu Island. Type in Kyoto.

Note. According to S. Kitamura (op. cit. 1957), *T. pseudotrigonolobum* Koidz., *T. brevisquamum* Koidz., and *T. frigidopratense* Koidz., also described from the Kuril Islands, are synonyms of this species. Possibly, *T. neglectum* Nakai and Koidz. (*Bot. Mag. Tokyo*, L, (1936) 145), described from Kamchatka, should also be included here, which, according to the original description, differs from *T. shumushunse* only by having entirely glabrous light green involucres.

43. **T. longipes** Kom. Fl. Kamch. III (1930) 198.

Perennial. Plants with rather thick root. Leaves 10–25 cm long and 1.5–5.0 cm wide, glabrous or subglabrous, runcinately pinnatipartite, with more or less deflexed lateral lobes often with toothed anterior margin, and larger terminal lobe, usually more or less toothed between lobes. Scapes usually longer than leaves, with rather profuse lax arachnoid tomentum below capitula. Involucres 14–18 mm long at flowering time; outer involucre bracts ovate to lanceolate-ovate, more or less appressed to inner bracts and considerably wider than them, membranous, light green with wide scarious border, with rather large but obtuse dark colored subterminal cornicles; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, with obtuse but larger subterminal cornicle, dark colored in the upper part. Florets yellow, scatteredly short hairy in the middle part of corolla, peripheral florets with inconspicuous dark stripes on the lower side of ligules. Achenes light yellowish-brown; body about 4 mm long, with numerous acute tubercles mostly in the upper half; cone 0.6–0.8 mm long; beak 11–13 mm long, pappus 7–8 mm long, white. Flowering July.

Meadows, forest glades, gravel-beds.—*Far East*: Kamchatka. Endemic. Described from valley of Paratunka River. Type and isotype in Leningrad.

- 459 44. **T. perlatescens** Dahlst. in Arkiv för Botanik XX A, 1 (1925) 13; Hult in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 224; Kom Fl. Kamch. III (1930) 196; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 17.—*T. longepetiolatum* Koidz. in Journ. Jap. Bot. XI (1935) 475.—*T. kudoanum* Tatew. and Kitam. in Acta Phytotax. et Geobot. III (1934) 104.—*T. squamatissium* Koidz. op. cit. 470—Ic.: Dahlst. op. cit. fig. 8.

Perennial. Plants with long thickish root; root collar with numerous dark brown remnants of dead leaves. Leaves 10–22 cm long and 2–7 cm wide, somewhat thickish, attenuate at the base in short narrow-winged petiole, scatteredly hairy to subglabrous, runcinately pinnatipartite with more or less deflexed lateral lobes, three or four on each side often with more or less toothed anterior margin, and longer terminal lobe, more or less toothed or entire between lobes. Scapes fewer, with lax arachnoid tomentum below capitula. Involucres 17–19 mm long at flowering time, 19–25 mm long at fruiting, olive green; outer involucre bracts ovate to broadly lanceolate, more or less deflected from inner bracts, with more or less large obtuse dark colored subterminal cornicle, with wide, scarious border, sometimes finely toothed; inner bracts oblong-linear, usually two times as long as longest outer bracts, dark colored in upper part, without or with short cornicles. Florets yellow, with scattered hairs in the middle

part of corolla, peripheral florets with dark stripes on the lower side of ligules. Achenes light yellowish-brown; body 4.0–4.5 mm long, covered with long acute tubercles in the upper part, only with short obtuse tubercles below; cone about 1 mm long; beak 7–12 mm long; pappus 8–9 mm long, whitish. Flowering June to August.

Meadows, herb slopes, roadsides.—*Far East*: Kamchatka, Kuril Islands, ?Sakhalin. Endemic. Described from Kamchatka. Type in Stockholm.

Note. Following S. Kitamura (op. cit.), I have cited the names of a few species described by Japanese authors from the Kuril Islands as synonyms of this species.

45. **T. malaisei** Dahlst. apud Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 223.—**!c.**: Dahlst. *ibid.* fig. 13.

Perennial. Plants 10–25 cm high, with thicker root. Leaves 10–25 cm long and 1.5–4.0 cm wide, glabrous or subglabrous, from undivided, irregularly large toothed to shallow pinnatipartite, with rather large terminal lobe. Scapes rather thick, with a few flexuous hairs below capitula, subglabrous. Involucre 14–18 mm long, dark green; outer involucral bracts broadly ovate to lanceolate-ovate, more or less appressed to inner bracts and much wider than them, with distinctly scarious border, with 460 shorter and subtuse, dark colored, subterminal cornicle; inner bracts oblong-linear or suboblong, usually two times as long as longest outer bracts, with or without indistinct subterminal cornicles. Florets yellow; peripheral florets with weaker dark stripes on lower side of ligules. Achenes light yellowish-brown; body about 3.5 mm long, covered with acute tubercles in the upper half; cone about 1 mm long; beak 9–11 mm long; pappus 7–8 mm long, white. Flowering June to July.

Meadows, herb slopes.—*Far East*: Kamchatka. Endemic. Described from garden specimens raised in Stockholm from seeds originating in Kamchatka. Type in Stockholm; isotype in Leningrad.

46. **T. hultenii** Dahlst. in Arkiv. för Botanik XX A, 1 (1925) 11; Kom. Fl. Kamch. III (1930) 195.—**!c.**: Dahlst. op. cit. fig. 7.

Perennial. Plants 8–15 cm high, with rather thick root. Leaves glabrous or subglabrous, 10–20 cm long and 1.5–3.5 cm wide, with rather long-winged petiole, shallow pinnatipartite or pinnatilobate, usually with intermediate smaller lobes and teeth. Scapes with a few flexuous hairs below capitula, subglabrous. Involucre 13–16 mm long, dark green; outer involucral bracts appressed to inner and slightly wider than them, ovate to broadly lanceolate, with narrow scarious border, with long, subacute, subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with short, obtuse, subterminal cornicle. Florets yellow

or light yellow (?). Achenes light yellowish-brown; body about 3.5 mm long, in the upper half with rather numerous acute tubercles; cone about 0.6 mm long; beak 9–10 mm long; pappus about 7 mm long, whitish. Flowering June to July.

Meadows, forest glades and gravel-beds.—*Far East*: Kamchatka. Endemic. Described from southern Kamchatka. Type in Stockholm; isotype in Leningrad.

47. ***T. ceratophorum*** (Ldb.) DC. Prodr VII (1838) 146; Ldb. Fl. Ross. II, 813, p. p.: Turcz. in Bull. Soc. Nat. Nosc. XXI, 3 (1848) 100 (Fl. baic.-dahur. No. 697); Hand.-Mazz. Monogr. Tarax. (1907) 62, p. p.: Kom. and Alis. Oprod. Rast. Dalnevost. Kr. II, 1092; Karavaev, Konsp. Fl. Yakut. (1958) 177.—*Leontodon ceratophorus* Ldb. Ic. pl. fl. ross. I (1829) 9 and Fl. Alt. IV (1833) 149, in not.—**Ic.**: Ldb. op. cit. (1829) t. 34; Hand.-Mazz. op. cit. t. 2, fig. 11.

Perennial. Plants 7–20 cm high, with thicker root; root collar covered with fewer brownish remnants of dead leaves. glabrous. Leaves glabrous or subglabrous, 5–15 cm long and 1.0–2.5 cm wide, usually undivided more or less sinuate-toothed, less often shallow pinnatilobate. Scapes solitary or a few, almost as long as leaves or slightly longer than them at
461 anthesis, more or less covered with loose arachnoid-hairy tomentum below capitula. Involucres 10–15 mm long, usually dark green; outer involucre bracts lanceolate-ovate to lanceolate, not firmly appressed to inner bracts and almost as wide as them, with rather wide scarious border, with long and acute dark colored subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with narrow scarious border, with long dark colored subterminal cornicles. Florets yellow. Achenes light brown; body 2.5–3.5 mm long, with rather numerous, acute tubercles in the upper third; cone 0.3–0.6 mm long; beak 7–9 mm long; pappus about 6 mm long, white. Flowering June to August.

Meadows, herb slopes and gravel-beds, roadsides.—*Arctic*: Arctic Siberia, Chukotka, Anadyr; *Eastern Siberia*: all regions; *Far East*: all regions. *General distribution*: Beringia, North America. Described from Kamchatka. Type in Leningrad.

Note. I have given the diagnosis of this species in its narrowest sense, relying basically on the type material. Its distribution area at present still has not been adequately studied and is possibly narrower. In a broad sense, *T. ceratophorum* is a very complex group of as yet inadequately studied apomictic and nonapomictic species, differing in the shape of the leaves, size of the capitula, relative size of the involucre bracts, size of the cornicles, and other characters.

48. ***T. longicorne*** Dahlst. in Arkiv för Botanik. V, 9 (1906) 9.—*T. macroceras* Dahlst. ibid. 15.—**Ic.**: Dahlst. ibid. t. 3, 7 and 8.

Perennial. Plants with rather thick root. Leaves 10–20 cm long and 1.5–4.0 cm wide, glabrous or subglabrous, pinnatilobate to pinnatipartite, with more or less deflexed lateral segments or lobes sometimes with toothed anterior margin and smaller terminal lobe, usually more or less toothed between lobes. Scapes one to three, almost as long as leaves, with more or less profuse lax arachnoid-hairy tomentum below capitula. Involucres 15–18 mm long, usually dark green; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts and slightly wider than them, usually with large (often even as long as the remaining part of bracts), acute or subacute subterminal cornicle; inner bracts, oblong-linear, one and one-half to two times as long as longest outer bracts, with shorter obtuse or subacute, usually dark colored, subterminal cornicle. Florets yellow, peripheral florets with inconspicuous dark stripes on lower side of ligules. Achenes light yellowish-brown; body about 4 mm long, covered with subacute tubercles in the upper half; cone about 0.5 mm long; beak 8–10 mm long; pappus 6–7 mm long, white. Flowering June to July.

Meadows, gravels and stony slopes.—*Arctic*: Siberia (eastern part); *Eastern Siberia*: Lena-Kolyma. Endemic. Described from lower reaches of Lena River. Type in Stockholm.

462 **Note.** In my opinion, the species *T. macrocerus* Dahlst., also described from Yakutia, does not differ significantly from *T. longicorne*.

49. ***T. acricorne*** Dahlst. apud Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 220, fig. 11 (Fl. Kamtch. IV).—**lc.**: Dahlst. op. cit.

Perennial. Leaves linear-lanceolate or broadly lanceolate, runcinately pinnatipartite or pinnatilobate, with narrow deltoid, entire, less often more or less toothed segments or lobes; terminal lobe often larger, acute. Scapes with more or less developed, lax arachnoid tomentum below capitula, as also leaves, glabrous or subglabrous in the remaining part. Involucres 14–17 mm long, olive-green; outer involucral bracts ovate-lanceolate to lanceolate, not firmly appressed to inner bracts and almost as wide as them, with more or less acute, dark purple, subterminal cornicles; inner bracts two times as long as longest outer bracts; with or without short, obtuse subterminal cornicle. Florets yellow; corolla of peripheral florets with darker stripes along veins on outer side, corolla tube covered with rather sparse, long hairs; anthers with developed pollen. Achenes not known. Flowering June to July.

Herb slopes and gravel-beds.—*Far East*: Kamchatka. Endemic. Described from vicinity of Petropavlosvsk-Kamchatsky. Type in Stockholm; isotype in Leningrad.

50. ***T. anchorifolium*** Kom. in Fl. Kamch. III (1930) 197.

Perennial. Plants with rather thick root; root collar covered with numerous dark brown remnants of dead leaves. Leaves rather numerous, 6–13 cm long and 1.5–4.0 cm wide, runcinately pinnatipartite with entire, less often more or less toothed, horizontal or more or less deflexed acute lobes; terminal lobe usually larger, obtuse or subacute. Scapes almost as long as leaves, with profuse arachnoid tomentum below capitula, scatteredly tomentose in the remaining part or subglabrous. Involucres 15–18 mm long, greenish; outer involucral bracts paler in color, membranous in the larger part, ovate to ovate-lanceolate, appressed to inner bracts and much wider than them, with large, obtuse subterminal cornicle; inner bracts one and one-half times as long as longest outer bracts, oblong-linear, usually with rather long subterminal cornicle. Florets bright yellow, peripherals with dark longitudinal stripe below, corolla tube glabrous or subglabrous; anthers with developed pollen. Mature achenes not known. Flowering June to July.

Meadows and gravels of river valleys, roadsides.—*Far East*: Kamchatka. Endemic. Described from valley of Ozeraya River. Type in Leningrad.

463 51. **T. kljutschevskoanum** Kom. Fl. Kamch. III (1930) 202.

Perennial. Plants 10–30 cm high, with rather thick root. Leaves more or less covered with scattered crisped hairs, 5–15 cm long and 1.5–3.0 cm wide, usually partly undivided, irregularly sinuate-toothed, partly pinnatilobate with horizontal or somewhat deflexed lateral lobes often with toothed anterior margin. Scapes with rather profuse, lax arachnoid tomentum below capitula. Involucre 14–18 mm long, dark green; outer involucral bracts lanceolate-ovate to broadly lanceolate, with scarios border, more or less appressed to inner bracts and slightly wider than them, with rather large subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with shorter, dark colored subterminal cornicle. Florets yellow, with ligules almost isochromous on both sides. Mature achenes not known; pappus about 6–7 mm long. Flowering June to July.

Meadows, stony slopes, gravel-beds, upper mountain zone.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (Klyuchevsk volcano). Type in Leningrad.

52. **T. evittatum** Dahlst. apud Hulten in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 221 (Fl. Kamtch. IV).—**lc.**: Dahlst. op. cit. fig. 12.

Perennial. Plants 10–25 cm high; root collar covered with fewer brownish remnants of dead leaves, glabrous. Leaves green, glabrous or subglabrous, 8–18 cm long and 18–35 mm wide, from undivided, more

or less toothed to pinnatipartite, with usually entire lateral lobes, smaller intermediate lobules and teeth, and larger terminal lobe. Scapes fewer, with weak arachnoid pubescence below capitula. Involucre 12–16 mm long, dark green; outer involucre bracts ovate to broadly lanceolate, more or less appressed to inner bracts, and almost as wide as them with very narrow, scarious border, with usually short subterminal cornicles; inner bracts oblong-linear, two times as long as longest outer bracts, with short, dark colored subterminal cornicles. Florets yellow; peripheral florets with or without very weak dark stripe on the lower side of ligules; corolla subglabrous. Achenes light brown; body about 3.5 mm long, with acute tubercles in the upper half and shorter, obtuse tubercles below; cone about 0.5 mm long; beak 10–12 mm long; pappus 6–7 mm long, white. Flowering May to June.

Meadows, herb slopes.—*Far East*: Kamchatka. Endemic. Described from Kamchatka. Type in Stockholm; isotype in Leningrad.

53. **T. platyceras** Dahlst. in Arkiv för Botanik. XX, A, 1 (1925) 6; Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 224; Kom. Fl. Kamch. III (1930) 196.—*lc.*: Dahlst. op. cit. fig. 4.

464 Perennial. Plants with rather thick root. Leaves 8–15 cm long and 2.5–5.5 mm wide, glabrous or subglabrous, pinnatilobate or pinnatipartite, with more or less deflexed segments or lobes usually toothed on anterior margin, and larger terminal lobe. Scapes arachnoid pubescent below capitula. Involucres 12–15 mm long, dark green; outer involucre bracts ovate to broadly lanceolate, wider than inner bracts, with small but wide subterminal cornicle; inner bracts oblong-linear, almost two times as long as longest outer bracts, dark colored at apex, without cornicle but usually with more or less distinct, callous thickening. Florets yellow. Achenes light brown; body about 4 mm long, with acute tubercles in the upper part, with shorter, obtuse tubercles below almost to the base, cone 0.7–1.0 mm long; beak 7–8 mm long. Flowering July to August.

Gravels, meadows, banks of reservoirs.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (Kuril Islands). Type in Stockholm.

54. **T. koraginense** Kom. Fl. Kamch. III (1930) 200.

Perennial. Plants 10–20 cm high, with thick, often many-headed root; root collar covered with numerous black-brown remnants of dead leaves. Leaves 8–20 cm long and 1.5–3.0 cm wide, subglabrous, usually pinnatilobate, with slightly deflexed, often toothed lobes, less often undivided, sinuate-toothed or pinnatipartite. Scapes with rather profuse, lax arachnoid tomentum below capitula. Involucres 12–15 mm long, dark green; outer involucre bracts ovate to ovate-lanceolate, more or less appressed to inner bracts and slightly wider than them, with narrow

scarious border, with small subterminal cornicle or partly without cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with or without short blackish subterminal cornicle. Florets yellow, with ligules almost isochromous on both surfaces. Achenes light brown; body about 3 mm long, with rather numerous acute tubercles in the upper half; cone about 0.6 mm long; beak in mature achenes not known; pappus 6–7 mm long, white. Flowering July.

Meadows, gravels.—*Far East*: Kamchatka. Endemic. Described from Karginsky Island. Type in Leningrad.

Note. Probably this species was described from the larger specimens of *T. chamissonis* and is a synonym of the latter species.

55. **T. yamamotoi** Koidz. in Acta Phytotax. et Geobot. II (1933) 127; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 14.—*T. alaid-litorale* Koidz. in Journ. Jap. Bot. XI (1935) 467.—*T. frigidulum* Koidz. ibid. (1935) 465.—*T. multisulcatum* Koidz. ibid. (1935) 467.—*T. gradifolium* Koidz. ibid. (1935) 472.—*T. megalanthum* Koidz. ibid. (1935) 471.

465 Perennial. Plants with long, often many-headed root. Leaves 5–17 cm long and 16–32 mm wide, obtuse, but often short-cuspidate, gradually narrowed at the base into narrow-winged petiole, from undivided, sinuate-toothed to pinnatipartite, with obtuse lateral lobe, three or four on each side, and small terminal lobe, glabrous. Scapes usually with lax arachnoid-hairy tomentum below capitula, less often subglabrous. Involucres 15–18 mm long at flowering time, dark green; outer involucral bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts, almost without scarious border, with small subterminal cornicle or partly without cornicle; inner bracts oblong linear, two times as long as longest outer bracts, dark purple in the upper part, without or with small cornicles. Florets yellow, with glabrous corolla, peripheral florets almost without dark stripes on the lower side of ligules. Achenes light yellowish-brown; body 3.5–4.0 mm long, with acute tubercles only in the upper part; cone about 0.9 mm long; beak 7–8 mm long; pappus about 7 mm long, whitish. Flowering June to July.

Meadows, herb slopes, roadsides.—*Far East*: Kuril Islands. Endemic. Described from Kuril Islands (Paramushir Island). Type in Kyoto.

Note. Following S. Kitamura (op. cit.), I consider the other five species also described from the Kuril Islands as synonyms of this species.

56. **T. latisquameum** Dahlst. in Arkiv. för Botanik. XX A, 1 (1925) 9; Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 223; Kom. Fl. Kamch. III (1930) 194.—**Ic.**: Dahlst. op. cit. fig. 6.

Perennial. Plants 8–15 cm high, with rather thick root. Leaves 7–12

cm long and 13–23 mm wide, glabrous or subglabrous, undivided, sinuate-toothed or pinnatilobate, with lateral lobes often more or less toothed on anterior margin, also usually more or less toothed between lobes. Scapes with lax, arachnoid-hairy tomentum below capitula. Involucres 12–15 mm long, dark green; outer involucral bracts broadly lanceolate to ovate, appressed to inner bracts, and wider than them, with narrow, scarious border, without subterminal cornicle or with short cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with or without small subterminal cornicles. Florets yellow. Achenes not known. Flowering July to August.

Forest glades, gravels, sandy river banks.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (Mutnovsk volcano). Type in Stockholm.

Note. Apparently, this species does not differ significantly from *T. chamissonis* and is a synonym of the latter.

57. *T. chamissonis* Green in Pittonia IV (1901) 208; Kitam. in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 6.—*T. trigonolobum* Dahlst. in Arkiv för Botanik XX, 1 (1925) 8; Kom. Fl. Kamch. III (1930) 192.—
466 *T. crassicollum* Koidz. in Journ. Jap. Bot. XI (1935) 469.—*T. aleuticum* Tatew. and Kitam. in Tatew. and Kobay. Contr. Fl. Aleut. (1934) 89.—*T. alaid-montanum* Koidz. op. cit. 467.—*T. ohashitatsuoii* Koidz. in Acta Phytotax. et. Geobot. II (1933) 125.—*T. ceratophorum* auct. non DC.: Hand. Mazz. Monogr. Tarax. (1907) 62, p. p.—**lc.**: Dahlst. op. cit. fig. 5 Kitam. op. cit. fig. 2, 2–3.

Perennial. Plants with rather thick root; root collar covered with numerous dark brown remnants of dead leaves. Leaves glabrous, 3–12 cm long and 0.8–2.5 cm wide, undivided, sinuate-toothed or pinnatilobate, with fewer and wider lobes, less often partly pinnatipartite. Scapes usually slightly longer than leaves, fewer, more or less covered with lax arachnoid-hairy tomentum below capitula. Involucres 11–15 mm long, dark green; usually more or less blackish; outer involucral bracts lanceolate-ovate to broadly lanceolate, appressed to inner bracts, and slightly wider than them, with very narrow scarious border, with short obtuse but rather wide blackish subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with more or less long, subobtuse, subterminal cornicles. Florets yellow; corolla entirely glabrous. Achenes light brown, sometimes with yellowish tinge; body 3–4 mm long, with rather numerous, acute tubercles in the upper half; cone 0.5–0.8 mm long; beak 7.0–8.5 mm long; pappus about 6 mm long, white. Flowering July to August.

Meadows, stony slopes, gravel-beds.—*Arctic*: Arctic Siberia, Chukotka, Anadyr; *Eastern Siberia*: Lena-Kolyma; *Far East*: Okhotsk, Kamchatka, Kuril Islands. *General distribution*: Japan (northern part),

Aleutian Islands, ?Alaska. Described from Aleutian Islands. Type in Berkeley (California).

Note. According to S. Kitamura (op. cit.), *T. crassicolum*, *T. alaid-montanum* and *T. ohashitatsui*, described from the Kuril Islands (I could not examine specimens), as well as *T. trigonolobum*, described from Kamchatka, are synonyms of this species, which is very similar to *T. ceratophorum*.

Possibly, *T. anadryense* Nakai and Koidz. (*Bot. Mag. Tokyo*, L. (1936) 144), described from the Anadyr River basin, is related to this species. However, according to its original diagnosis, this species differs from *T. chamissonis* by the presence of green involucre with shorter outer involucral bracts, and also smaller cornicles, which are usually absent on the inner bracts. According to the latter character, this species also comes considerably closer to such species as, for example, *T. brachyceras* Dahlst. and *T. brevicorne* Dahlst., with weakly developed cornicles on the involucral bracts.

58. **T. kojimae** Kitam. in Acta Phytotax. et Geobot. II (1933) 119 and in Mem. Coll. Sc. Univ. Kyoto, ser. B, XXIV, 1 (1957) 6.

Perennial. Plants about 8 cm high, with slender root; root collar covered with numerous dark remnants of dead leaves. Leaves 4–6 cm long and about 1 cm wide, obtuse, without distinct petiole, pinnatilobate, with few short, sometimes toothed lobes, scatteredly hairy when young, later subglabrous. Scapes slightly longer than leaves, more or less arachnoid-hairy, with rather profuse lax arachnoid tomentum below capitula. Involucres 12 mm long at flowering time, dark green; outer involucral bracts lanceolate, not closely appressed to inner bracts, with indistinct scarious border and scattered short cilia, with well developed, but short, subterminal cornicle; inner involucral bracts oblong-linear, two times as long as longest outer bracts, with short, but not always distinct, dark colored subterminal cornicles. Florets yellow. Immature achenes with 3.0–3.5 mm long body; very short cone, 2.5 mm long beak and 5.5 mm long pappus. Flowering June to July.

Meadows, herb slopes.—*Far East*: Kuril Islands. Endemic. Described from Paramushir Island. Type in Kyoto.

59. **T. macilentum** Dahlst. in Arkiv. för Botanik. V, 9 (1906) 17; Karavaev, Kansk. Fl. Yakut. (1958) 178. —**lc.**: Dahlst. op. cit. t. 9.

Perennial, plants with slender root. Leaves 6–15 cm long and 12–25 mm wide, glabrous or subglabrous, more or less pinnatilobate; lateral lobes entire or with few teeth on the upper margin. Scapes with more or less profuse arachnoid-hairy tomentum below capitula. Involucres 15–16 mm long, dark green; outer involucral bracts ovate-lanceolate to lanceolate,

more or less appressed to inner bracts and slightly wider than them, with narrow, scarious border, more or less violet in the upper part, with short, more or less subacute, subterminal cornicle; inner involucre bracts oblong-linear, one and one-half to two times as long as longest outer bracts, usually more or less pinkish-violet in the upper part, with short, more or less subacute, subterminal cornicle. Florets yellow: peripheral florets with more or less distinct dark stripes on the lower side of ligules. Achenes light yellowish-brown; body about 3–7 mm long, covered with acute tubercles in the upper half; cone 0.8–1.0 mm long; beak 8–10 mm long; pappus about 7 mm long, white. Flowering June to July.

Meadows, herb slopes, forest glades.—*Eastern Siberia*: Yenisei, Angara-Sayans, Lena-Kolyma. Endemic. Described from the valley of Lena River. Type in Stockholm.

60. **T. koraginicola** Kom. Fl. Kamch. II (1930) 201.

Perennial. Plants 8–20 cm high, with rather thick root; root collar covered with numerous black-brown remnants of dead leaves. Leaves 4–10 cm long and 1.5–2.5 cm wide, glabrous or subglabrous, usually undivided, irregularly sinuate-toothed, less often partly pinnatilobate, on short broad-winged petioles. Scapes with loose arachnoid-hairy tomentum below capitula. Involucre 12–17 mm long, dark green; outer involucre bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts, and almost as wide as them, almost without scarious border, with rather large, but obtuse, subterminal cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, with short, dark colored, subterminal cornicle. Florets yellow(?). Achenes light brown; body 4.0–4.5 mm long, with rather numerous acute tubercles in the upper third, gradually terminating in 1.5–1.8 mm long cone; beak 8–9 mm; pappus about 7 mm, white. Flowering July.

Meadows, gravels, banks of reservoirs.—*Far East*: Kamchatka. Endemic. Described from Karaginsky Island. Type in Leningrad.

61. **T. leptoceras** Dahlst. in Akriv. för Botanik. XX A, 1 (1925) 5; Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 223; Kom. Fl. Kamch. III (1930) 193.—*lc.*: Dahlst. op. cit. fig. 2.

Perennial. Plants 4–15 cm high, with slender root; root collar with fewer remnants of dead leaves, glabrous or weakly hairy. Leaves 4–10 cm long and 7–25 mm wide; glabrous or subglabrous, with more or less deflexed, often toothed lobes, more or less toothed between lobes. Scape with rather profuse, lax arachnoid tomentum below capitula. Involucres 12–15 mm long; outer involucre bracts broadly lanceolate to linear-lanceolate, more or less deflected from inner bracts to recurved, as wide as inner bracts, herbaceous-membranous, light green with wide scarious

margin, corncle indistinct or absent; inner bracts usually one and one-half times as long as longest outer bracts, oblong-linear, green, more or less dark colored in the upper part, with or without short and narrow subterminal corncle. Florets yellow, corolla with short hairs in the middle part, ligules almost isochromous on both surfaces. Mature achenes not known. Flowering June to July.

Sands and gravel-beds usually near seacoast.—*Far East*: Kamchatka. Endemic. Described from vicinity of Petropavlovsk-Kamchatsky. Type and isotype in Leningrad.

62. **T. dilutum** Dahlst. in Arkiv. för Botanik. XX A, 1 (1925) 4; Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 221; Kom. Fl. Kamch. III (1930) 195.—**Ic.**: Dahlst. op. cit. fig. 2.

Perennial. Plants 5–8 cm high, with rather thick root. Leaves 4–8 cm long and 8–22 mm wide, light green, glabrous or subglabrous, outer leaves in rosette pinnatilobate, with more or less deflexed lobes and small terminal lobe; inner leaves in rosette, usually undivided, sinuate-toothed. Scapes fewer, more or less arachnoid pubescent below capitula. Involucres 8–10
469 mm long, green; outer involucral bracts broadly lanceolate to lanceolate, less firmly appressed to inner bracts and almost as wide, partly with more or less large subterminal corncle, partly with callous thickening; inner involucral bracts oblong-linear, one and one-half to two times as long as longest outer bracts, usually with small subterminal corncle. Florets light yellow. Achenes not known. Flowering July.

Meadows, banks of reservoirs, gravel-beds.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (near village of Klyuchevsky). Type in Stockholm.

63. **T. vulcanorum** Koidz. in Journ. Jap. Bot. IX (1933) 331; Kitam in Mem. Coll. Sc. Univ. Kyoto, Ser B, XXIV 1 (1957) 9.

Perennial. Plants with rather thick root; root collar covered with rather numerous dark brown remnants of dead leaves. Leaves 4.5–10 cm long and 14–20 mm wide, gradually narrowed into broad-winged petiole, initially scattered hairy on both surfaces, later subglabrous, pinnatipartite, with deflexed, acuminate, lateral lobes, four or five on each side, and rather large terminal lobe. Scapes 10–15 cm long with profuse loose tomentum below capitula. Involucre 15–17 mm long; outer involucral bracts ovate-lanceolate to broadly lanceolate, more or less appressed to inner bracts, without scarious border, without subterminal corncle, less often with small corncle; inner involucral bracts oblong-linear, one and one-half to two times as long as longest outer bracts, with or without small subterminal cornicles. Florets yellow, peripherals with dark stripes on the lower side of ligules; corolla short hairy in the middle part. Achenes not known. Flowering July.

Meadows, herb slopes.—*Far East*: Kuril Islands. Endemic. Described from Kunashir Island. Type in Tokyo.

64. **T. hjeltii** (Dahlst.) Dahlst. in Arkiv. för Botanik V, 9 (1906) 6 and in Kungl. Sv. Vet. Akad. Handl. VI, 3 (1928) 37.—*T. ceratophorum* subsp. *hjeltii* Dahlst. in Bot. Notis. (1905) 162.—*T. officinale* var. *boreale* Hjelt apud Hjelt and Hult. in Meddel. Soc. pro Fauna et Flora Fenn. XII (1855) 133.—**lc.**: Dahlst. op. cit. (1906) t. 1–2 and (1928) fig. 9 and t. 8, fig. 1–7.—**Exs.**: Herb. norm. No. 5129; Pl. Finl. exs. No. 395; Tarax. scand. exs. fasc. 4, No. 1.

Perennial. plants 10–15 cm high, with slender root. Leaves 10–20 cm long and 1.5–4.0 cm wide, glabrous, or subglabrous, runcinately pinnatipartite with deflexed, often toothed, lateral lobes and larger terminal lobe to undivided, sinuate-toothed. Scapes with lax arachnoid-hairy tomentum only below capitula, rather thick. Involucres 13–18 mm long, green; outer involucre bracts pale, ovate to oblong, not closely appressed
470 to inner bracts or more or less deflected from them, wider than inner bracts; with large subobtusate subterminal cornicle; inner bracts oblong-linear, usually one and one-half times as long as longest outer bracts; with rather large, dark colored subterminal cornicle. Florets light yellow, short hairy in the middle part of corolla. Achenes light brown; body about 3.5 mm long, covered with acute tubercles in the upper half; cone 0.5–0.8 mm long; beak 9–12 mm long; pappus 7–8 mm long, white. Flowering June to July.

Meadows, stony slopes.—*Arctic*: Arctic Europe (western part); *European Part*: Karelia-Lapland (northern part). *General distribution*: Scandinavia. Described from Finland. Type in Helsinki.

65. **T. murmanicum** Orlova sp. nova in Addenda XXVIII, 730

Perennial. Plants with rather thick, many-headed root. Leaves 10–20 cm long and 2–7 cm wide, with scattered short hairs, acute, pinnatipartite or pinnatilobate, with rather narrow, more or less deflexed, lateral segments or lobes. Scapes usually few, entirely glabrous, longer than leaves at fruiting. Involucres 18–22 mm long, green; outer involucre bracts ovate to broadly lanceolate, often more or less toothed in the lower part, usually more or less deflected from inner bracts to recurved at fruiting, with small subterminal cornicle; inner involucre bracts oblong-linear. Florets yellow, corolla with long hairs in the middle part. Achenes brownish; body about 4 mm long, with rather numerous acute tubercles in the upper part; cone about 0.5 long; beak slender, about 13 mm long; pappus 8–9 mm long, white. Flowering July to August.

Marine coastal sands.—*Arctic*: Arctic Europe (Kola Peninsula). Endemic. Described from Rybachi Peninsula. Type (Murmansk Region,

Rybachy Peninsula, Laush Inlet, 26.VIII.1955, N. Orlova and others) in Kirovsk (Polar-alpine Botanic Garden).

Note. The diagnosis of this species was kindly supplied to me for publication by N.I. Orlova, who treated the genus *Taraxacum* Wigg. for "*Flora Murmanskoj Oblasti*" (Flora of the Murmansk Region).

66. **T. norvegicum** (Dahlst.) Dahlst. in Arkiv. för Botanik V, 9 (1906) 22 and in Kungl. Sv. Vet. Akad. Handl. VI, 4 (1928) 45.—*T. ceratophorum* subsp. *norvegicum* Dahlst. in Bot. Notis. (1905) 151.—**lc.:** Dahlst. op. cit. (1906) t. 12 and 13, (1928) fig. 11 and t. 6.

Perennial. Plants 6–20 cm high, with rather thick root. Leaves 8–20 cm long and 2.0–4.5 cm wide, light green, glabrous, usually pinnatipartite with long and narrow horizontal, entire or subentire lateral lobes, three to seven on each side, and small terminal lobe, with more or less numerous
471 intermediate teeth or lobules between lobes. Scapes glabrous or with weak arachnoid pubescence below capitula. Involucres 16–17 mm long, dark green; outer involucre bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts or slightly deflected, slightly wider than inner bracts, often somewhat toothed, with very narrow scarious border, with short (or medium-sized), dark colored subterminal cornicle; inner involucre bracts oblong-linear, usually two times as long as longest outer bracts, with small dark colored subterminal cornicles (sometimes two on each bract) or partly without cornicle. Florets yellow; peripheral florets usually with dark stripe on lower side of ligules. Achenes brownish; body 3.5–3.8 mm long, with a few longitudinal furrows, covered with acute tubercles in the upper third; cone about 1 mm, long; beak 6–7 mm long; pappus 6–7 mm long, white. Flowering July to August.

Meadows, herb slopes, often near seacoast.—*European Part:* Karelia-Lapland (Kola Peninsula). *General distribution:* Scandinavia. Described from Norway. Type in Stockholm.

67. **T. simulum** Brenner in Meddel. Soc. pro fauna et flora fennica XXXIII (1907) 109 p. p.; Dahlst. in Kungl. Sv. Vet. Handl. VI, 3 (1928) 49 descr. emend. —**lc.:** Dahlst. *ibid.* fig. 13–14 and t. 6, fig 1–6.

Perennial. Plants with rather thick root. Leaves 6–12 cm long and 13–27 cm wide, green, glabrous with short-winged petioles, from undivided, sinuate-toothed to partly pinnatilobate or pinnatipartite with lateral lobes entire or more or less toothed on anterior margin. Scapes with weakly arachnoid pubescence below capitula or glabrous. Involucre 14–18 mm long, green; outer involucre bracts lanceolate-ovate to broadly lanceolate, usually more or less deflected from inner bracts and somewhat wider than them, almost without scarious border, with small, dark subterminal cornicle or with a callous thickening; inner bracts oblong-

linear, one and one-half times as long as longest outer bracts, with small, dark, subterminal cornicles. Florets yellow, peripherals with dark stripes on, lower side of ligules. Achenes light yellowish-brown; body 3.2–3.5 mm long, covered with acute tubercles in the apical third; cone about 1 mm long; beak 9–11 mm long; pappus 6–7 mm long. Flowering July to August.

Meadows, herb slopes.—*Arctic*: Arctic Europe (western part); *European Part*: Karelia-Lapland (Kola Peninsula). *General distribution*: Scandinavia. Described from northern Finland. Type in Helsinki.

68. ***T. novae-zemliae*** Holmboe in Lynge, Vasc. pl. Nov. Zemlya (1923) 87.—**lc.**: Holmboe, *ibid.* t. 29, fig. 1–3.

472 Perennial. Plants with rather thick root. Leaves 6–12 cm long and 10–23 mm wide, glabrous, from undivided, more or less sinuate-toothed to pinnatilobate, with more or less deflexed lateral lobes often having toothed upper margin, and much larger, often more or less toothed, terminal lobe. Scapes more or less arachnoid-hairy tomentose only below capitula, usually slightly longer than leaves. Involucre 15–17 mm long, dark green; outer involucre bracts appressed to inner bracts and slightly wider than them, lanceolate-ovate to broadly lanceolate, with small but distinct subterminal cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, with small obtuse subterminal cornicle. Florets yellow, peripheral florets with more or less distinct dark stripes on the lower side of ligules. Achenes light yellowish-brown; body about 3.5 mm long, covered with acute tubercles in the upper third, with short obtuse tubercles below; cone about 1 mm long; beak 7–8 mm long; pappus about 6 mm long, white. Flowering July to August.

Meadows, herb slopes. —*Arctic*: Novaya Zemlya. Endemic. Described from Novaya Zemlya (Sukhoi Nos Cape). Type in Oslo.

Note. Unlike the very similar species *T. brevicorne* Dahlst. and *T. brachyceras* Dahlst., it does not form normally developed pollen grains.

69. ***T. brevicorne*** Dahlst. in Arkiv för Botanik V, 9 (1905–1906) 11; Holmboe in Lynge, Vasc. Pl. Nov. Zemlya (1923) 86; Schischk. in Kryl. Fl. Zap Sib. XI, 3002. —*T. ceratophorum* auct. non DC.: Hand.-Mazz. Monogr. Tarax. (1907) 62, p. p.—**lc.**: Dahlst. op. cit. t. 4.

Perennial. Plants with rather thick, long root. Leaves 6–20 cm long and 2–5 cm wide, glabrous, from undivided, sinuate-toothed to more or less pinnatilobate, usually with rectangular teeth and lobes. Scapes almost as long as leaves or slightly longer, glabrous or with lax arachnoid-hairy tomentum below capitula. Involucre 13–15 mm long, green; outer involucre bracts ovate to broadly lanceolate not closely appressed to inner bracts and slightly wider than them, with short, sometimes indistinct

subterminal cornicle; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, often pinkish at the apex, usually with short (0.5–1.0 mm long) dark subterminal cornicle. Florets yellow. Achenes light yellowish-brown; body about 3.5 mm long, covered with numerous acute tubercles in the upper half; cone about 0.5 mm long; beak 8–10 mm long; pappus 6–7 mm long, white. Flowering July to August.

Herb slopes, meadows, roadsides.—*Arctic*: Arctic Europe, Novaya Zemlya, Arctic Siberia; *Western Siberia*: Ob' Region (lower reaches of Ob' River); *Eastern Siberia*: Lena-Kolyma (northern part). Endemic. Described from Novaya Zemlya. Type in Stockholm.

- 473 70. **T. brachyceras** Dahlst. in Arkiv för Botanik V, 9 (1905–1906) 19.—*T. ceratophorum* auct. non DC.: Hand.-Mazz. Monogr. Tarax. (1907) 62, p. p.—**lc.**: Dahlst. op. cit. t. 10–11.

Perennial. plants with rather thick and long root. Leaves 6–15 cm long and 1.5–3.5 cm wide, glabrous, from undivided sinuate-toothed to pinnatilobate, usually with intermediate teeth and lobes. Scapes one to three, almost as long as leaves, glabrous or with weak archnoid pubescence below capitula. Involucres 17–19 mm long, dark green; outer involucre bracts lanceolate-ovate to broadly lanceolate, usually appressed to inner bracts and slightly wider than them, with indistinct, very short subterminal cornicle or entirely without them; inner bracts oblong-linear, usually one and one-half times as long as longest outer bracts, with indistinct short subterminal cornicles or entirely without them. Florets yellow, with darker, greenish lilac stripe on the lower side of ligule. Achenes light yellowish-brown; body about 3.7 mm long, covered with more or less numerous, long, acute, tubercles in the upper half; cone 0.8–1.0 mm long; beak 8–10 mm long; pappus about 7 mm long, white. Flowering July to August.

Meadows, herb slopes.—*Arctic*: Arctic Europe (Vaigach Island). *General distribution*: Scandinavia (arctic part), Spitsbergen, Greenland. Described from Spitsbergen. Type in Stockholm.

Note. Possibly, this species has a much wider distribution, not only in Arctic Europe but also in Siberia.

71. **T. confusum** Schischk, in Grossh. Fl. Kavk. IV (1934) 251; Grossh. Opred. Rast. Kavk. (1949) 514; Kapeller in Fl. Gruzii, VIII, 660; Sofieva in Fl. Azerb. VIII, 540.—?*T. karjaginii* Hagl. ex Grossh. Opred. Rast. Kavk. (1949) 514, diagn. in Russian.—*T. ceratophorum* auct. fl. caucas. non DC.—*T. alpinum* auct. non Hegetschw. and Heer: Hand.-Mazz Monogr. Tarax. (1907) 94, p. p.

Perennial. Plants with rather thick, often many-headed root; root collar covered with numerous, somewhat lustrous, dark brown remnants of dead leaves, glabrous. Leaves green, glabrous or subglabrous, 4–14 cm long

and 5–30 mm wide, usually runcinately pinnatipartite or pinnatilobate, with wide or narrow deltoid, often more or less deflexed lateral segments and lobes; terminal lobe always larger. Scapes erect or ascending, slightly longer than leaves or almost as long, more or less covered with lax archnoid-hairy tomentum below capitula, usually subglabrous in the remaining part. Involucres 10–15 mm long, green; outer involucral bracts lanceolate-ovate to lanceolate, not closely appressed to inner bracts or more or less deflected from them, somewhat wider than them, with very narrow scarious border, often more or less pinkish, with rather large but obtuse subterminal cornicle; inner bracts oblong-linear, usually two times
 474 as long as longest outer bracts; with well-developed subobtuse, subterminal cornicles. Florets light yellow(?), peripheral florets with wide dark stripe on the outer side; corolla glabrous or subglabrous. Achenes light brown; body 3–4 mm long, with rather numerous, acute, tubercles in the upper third; cone 0.4–0.6 mm long; well separated from beak, beak 6–9 mm long; pappus 6–7 mm long, white. Flowering July to August.

Meadows, stony slopes in alpine zone of mountains.—*Caucasus*: Ciscaucasia, Dagestan, Eastern and Western Transcaucasia. Endemic. Described from Greater Caucasus Range. Lectotype (Kuban Basin, alpine meadows in upper parts of Khotyutau, 15.VII.1909, No. 956, E. and N. Busch) in Leningrad.

72. **T. schelkovnikovii** Schischk. in Grossh. Fl. Kavk. IV (1934) 251; Grossh. Opred. Rast. Kavk. 251.

Perennial. Plants 10–40 cm high, with rather thick, often many-headed root; root collar glabrous. Leaves 10–30 cm long and 2–6 cm wide, subglabrous, slightly glaucescent, usually lyrate or runcinately pinnatipartite, with more or less deflexed lateral lobes, two to five on each side, with entire or more or less toothed anterior margin, and larger terminal lobe, less often pinnatilobate or even partly (usually outer leaves of rosette) undivided, large sinuate-toothed. Scapes glabrous or with somewhat flexuous hairs below capitula. Involucre 12–17 mm long; outer involucral bracts broadly lanceolate to lanceolate, more or less deflexed, almost as wide as inner bracts, membranous, light green, with scarious border, with rather large, subacute, subterminal cornicle, but usually not on all bracts; inner bracts oblong-linear, one and one-half times as long as longest outer bracts, dark at apex and at least in some bracts, with more or less large cornicle. Florets yellow, peripheral florets with wide dark stripe on lower side of ligules. Achenes light brown, body 3.5–40 mm long, with rather numerous but shallow longitudinal furrows, covered with acute tubercles in the upper half, only with short obtuse tubercles below; cone about 1 mm long; beak 7.5–8.5 mm long; pappus about 6 mm long, white. Flowering July to August.

Meadows, herb slopes, gravel-beds in middle and upper mountain zones.—*Caucasus*: Eastern Transcaucasia (western part), Southern Transcaucasia. Endemic. Described from Lake Sevan. Lectotype (Lake Gokcha near village of Aleksandrovka, 24.VIII.1926, A. Schelkovnikov) in Leningrad.

475 Subsection 5. **Macrocornuta** (Van Soest) Schischk. comb. nova.—*Taraxacum* sect. *Macrocornuta* Van Soest in Acta Bot. Neerland. IX (1960) 304.—Usually medium, less often large, or rather small plants of plains and lower mountains, less often alpine, with more or less thick root, flowering usually in April–June, less often (in middle and upper mountain zones) in June–July; root collar glabrous or covered with brownish tomentum in axils of leaves. Scapes more or less arachnoid pubescent below capitula, less often subglabrous or glabrous. Involucral bracts, all or some, with small or much large cornicle; outer involucral bracts fewer, more or less appressed to inner bracts or more or less deflected from them to deflexed, inner two and one-half to three times less often one and one-half to two times as long as longest outer bracts. Florets yellow or light yellow. Achenes light brown; body 2.5–3.5, less often to 5 mm long, with fewer acute tubercles in the upper part, rather abruptly terminating in 0.5–1.5 mm-long cone; beak 6–12 mm long, always more than one and one-half, usually more than two times as long as body of achenes.

Type of subsection : *T. wallichii* DC.

Note. A highly polymorphic subsection comprising several, more or less well-separated, groups of species, possibly deserving the rank of separate subsections. The most typical species of this subsection have appreciably reduced outer involucral bracts and a small (2.5–3.5 mm long) achene body with a long cone.

73. **T. glaucanthum** (Ldb.) DC. Prodr. VII (1838) 147; Ldb. Fl. Ross. II, 814; Hand.-Mazz. Monogr. Tarax. (1907) 44; Schischk. in Fl. Yugo-Vost. VI, 462 and in Kryl. Fl. Zap. Sib. XI, 3000.—*Leontodon glaucanthus* Ldb. Ic. pl. fl. Ross. I (1829) 9 and Fl. Alt. IV (1833) 151.—*Taraxacum officinale* Y. *glaucanthum* (Ldb.) Kryl. Fl. Alt. III (1904) 741.—**Ic.**: Ldb. op. cit. (1829) t. 33; Hand.-Mazz. op. cit. t. 1, fig. 17 and t. 4, fig. 6.

Perennial, Plants 6–20 cm high, with thicker root; root collar covered with brownish remnants of dead leaves, with more or less dense brownish tomentum of long flexuous hairs in their axil. Leaves scatteredly hairy or glabrous, glaucous-green, 4–12 cm long and 8–20 mm wide, undivided, sinuate-toothed or pinnatilobate, or even pinnatipartite, with more or less deflexed lateral lobes. Scapes with sparse, lax arachnoid tomentum below capitula, usually subglabrous. Involucres 8–14 mm long; outer involucral

bracts not closely appressed to inner bracts or more or less deflected, slightly wider than inner bracts, membranous with wide scarious border, without or with small subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, herbaceous, glaucous-green, with or without short subterminal cornicle. Florets light yellow; peripheral florets with dark stripe on lower side of ligules; corolla glabrous or subglabrous. Achenes light brown; body 4–5 mm long, with a few, acute, tubercles in the upper third; cone 1.0–1.5 mm long; beak 6–9 mm long; pappus 7–8 mm long, whitish. Flowering May to June.

Alkaline meadows, salt marshes.—*European Part*: Lower Volga; *Western Siberia*: Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-
 476 Sayans; *Soviet Central Asia*: Aralo-Caspian, Balkhash, Dzhungaria-Tarbagatai, Kyzyl-Kum. *General distribution*: bordering areas of China and Mongolia. Described from Altai. Type in Leningrad.

Note. The type specimens of this species have undivided, toothed leaves, and their involucre bracts lack a cornicle, but, unfortunately, have no achenes. As a result, I am not sure if the description of the achenes given in the monograph of this genus (H. Handel-Mazzetti, loc. cit.) actually belongs to this species.

74. **T. glaucivirens** Schischk. sp. nova in Addenda XXVIII, 730.

Perennial. Plants 8–20 cm high, with rather thick root; root collar covered with brownish remnants of dead leaves, with more or less profuse loose tomentum in their axil. Leaves 5–12 cm long and 1.0–2.5 cm wide, glabrous or subglabrous, glaucous-green, runcinately pinnatifid or pinnatilobate, with more or less deflexed, often toothed segments or lobes. Scapes with sparse, lax arachnoid-hairy tomentum below capitulum, usually glabrous below; involucre 10–16 mm long at flowering time, glaucous-green, involucre bracts with well developed but rather short, subterminal cornicles, outer bracts broadly ovate to broadly lanceolate, slightly wider than inner bracts and usually appressed to them, with rather wide and very distinct scarious border; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts. Florets light yellow or whitish (?), with scattered short hairs in the middle part of corolla, with wide dark stripe on the lower side of ligules. Achenes light brown; body 3.5–4.0 mm long, with a few acute tubercles in the upper third; cone 1.0–1.5 mm long, well separated from beak; beak 7–9 mm long; pappus about 8 mm long; white. Flowering June to August.

Stony slopes and rocks in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Hissar Range. Type (southern slope of Hissar Range, gorge of Kondara River in the basin of Varzoba River, Rundasht Plateau, 20.VII.1945, No. 832, V. Pissjaukova) in Leningrad.

75. **T. klokovii** Litvinenko in Uchen. Zap. Kharkiv. Derzh. Univ. 2-3 (1935) 150; Klovov in Vozn. Rosl. URSR (1950) 593.— **lc.**: Litvinenko, op. cit. 151.

Perennial. Plants with rather thick vertical root; root collar covered with brownish remnants of dead leaves, with sparse, not always conspicuous, lax brownish tomentum of long, flexuous hairs in their axil. Leaves scatteredly crisped hairy to entirely glabrous, 7-20 cm long and 7-25 mm wide, runcinately pinnatipartite, with more or less deflexed, long-acuminate, lateral lobes of variable lengths and larger terminal lobe. Scapes (1)2-5(10), almost as long as leaves, entirely glabrous at anthesis
477 or with few flexuous hairs below capitula. Involucres 12-16 mm long; outer involucral bracts broadly ovate to broadly lanceolate, appressed to inner bracts and much wider than them, with rather wide, scarious, more or less pinkish border, without cornicle, inner bracts oblong-linear, darker and often pinkish at apex, usually two to two and one-half times as long as longest outer bracts, also without cornicle. Florets light yellow; peripheral florets with wide dark stripe on the lower side of ligules, with rather numerous hairs in the middle part. Achenes light yellowish-brown; body 3.5-4.0 mm long, with rather numerous longitudinal furrows, with rather numerous acute tubercles in the upper half; cone 0.8-1.0 mm long; beak 6-8 mm long; pappus 5.5-6.5 mm long, whitish. Flowering April to May.

Wet, weakly saline meadows.—*European Part*: Middle Dnieper (eastern part), Volga-Don (western part). Endemic. Described from valley of North Dvina River near Izyum. Type in Kiev; isotype in Leningrad.

76. **T. alatavicum** Schischk. sp. nova in Addenda XXVIII, 731

Perennial. Plants with rather thick (5-10 mm thick in the upper part) vertical root; root collar covered with dark brown remnants of dead leaves. Leaves rather numerous, 8-20 cm long and 2-4 cm wide, glabrous or weakly arachnoid-pubescent, runcinately pinnatifid with deflexed acute deltoid lobes, often toothed, terminal lobe smaller. Scapes usually slightly longer than leaves, solitary or few, thicker, glabrous, with weak arachnoid pubescence below capitula. Involucres about 15 mm long; outer involucral bracts more or less deflected from inner, oblong or oblong-lanceolate, dark green, with narrow scarious border, with or without inconspicuous subterminal cornicles; inner involucral bracts usually two and one-half times as long as longest outer bracts, oblong-linear, green with narrow scarious border, dark at apex with distinct subterminal cornicle. Florets yellow (?); peripheral florets with wide dark (lilac) stripe on their lower side of ligules. Achenes light brown, ribbed, thin; body 3.5-4 mm long, with numerous acute tubercles almost to the base; cone 0.7-1.0 mm long,

beak rather thin, 6.5–8.0 mm long; pappus 5.5–6.5 mm long, white. Flowering May to June.

Stony slopes and gravel-beds, roadsides.—*Soviet Central Asia*: Balkhash (eastern part), Dzhungaria-Tarbagatai (Dzhungarian Alatau). *General distribution*: Probably occurs in area bordering China. Described from Dzhungarian Alatau. Type (southwestern part of Dzhungarian Alatau, boulder taluses of Chulak Mountain, near village of Chingilda, 27.V.1955. V. Goloskokov) in Leningrad.

77. **T. contristans** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 9 and in Fl. Uzb VI, 464.

- 478 Perennial. Leaves green or slightly glaucescent, glabrous or with occasional crisped hairs, 10–30 cm long and 2–6 cm wide, deeply pinnatipartite with small, unequal, intermediate lobules and teeth; lateral lobes usually narrow and long, with occasional teeth on the upper margin, horizontal or slightly deflexed. Scapes few, often with scattered arachnoid pubescence, with profuse, lax arachnoid tomentum below capitula. Involucres 13–15 mm long; outer involucral bracts slightly glucescent, appressed to inner bracts (more or less deflexed in fruits) and slightly wider than them, with narrow scarious border, with short dark subterminal cornicles on all bracts; inner involucral bracts oblong-linear, two to two and one-half times as long as longest outer bracts, usually with short, obtuse, subterminal cornicle (sometimes two on each bract). Florets yellow; peripheral florets with dark stripes on the lower side of ligules, often with scattered short, less often longer hairs in the middle part of corolla. Achenes light brown; body 3.5–4.0 mm long, with 11–15 longitudinal furrows, with rather numerous acute tubercles in the upper third; cone 0.8–1.0 mm long well separated from beak; beak 11–12 mm long; pappus 6–7 mm long, white. Flowering April to May.

Wet meadows, gardens and parks, roadsides, along irrigation channels, sometimes in “tugais”*.—*Soviet Central Asia*: Syr-Darya, Pamiro-Alai (western part). Endemic. Described from Fergana Valley. Type in Tashkent; isotype in Leningrad.

78. **T. bicornis** Dahlst. in Arkiv för Botanik V, 9 (1905–1906) 29; Schischk. in Fl. Yugo-Vost. VI (1936) 461 and in Fl. Turkm. VII (1960) 319; Kovalevskaya in Fl. Uzb. VI, 463.—*T. ceratophorum* auct. non DC.: Hand.-Mazz. Monogr. Tarax. (1907) 62, p. p.—**lc.**: Dahlst. op. cit. t. 17.

Perennial. Plants with rather thick vertical root. Leaves 4–16 cm long and 8–30 mm wide, pinnatilobate or pinnatipartite, with rather wide

* Tugai—Vegetarian-covered bottomland—General Editor.

horizontal or somewhat deflexed lobes, often toothed, glabrous or subglabrous. Scapes usually few, as long as or slightly longer than leaves, more or less profusely lax arachnoid tomentose below capitula. Involucres 11–13 mm long, pale green; outer involucre bracts more or less deflected from inner and almost as wide as latter, ovate to ovate-lanceolate, herbaceous, often pinkish at apex, usually with long subterminal cornicle; inner involucre bracts herbaceous, oblong-linear, two and one-half times as long as longest outer bracts, with well-developed subterminal cornicle, often two on each bract. Florets yellow, peripheral florets with wide lilac stripe on the lower side of ligule; corolla with scattered short hairs in the middle part. Achenes light yellowish-brown; body 3–4 mm long, with
 479 rather numerous, acute tubercles in the upper half; cone 0.8–1.2 mm long; beak 7–9 mm long, pappus 5.5–7.0 mm long, white. Flowering April to May.

Alkaline meadows, more or less stable sands, salt marshes, often as weed in crop fields, roadsides.—*Soviet Central Asia*: Balkhash (southern part), Tien Shan, Syr-Darya, Amu-Darya, mountainous Turkmenia. *General distribution*: Dzhungaria-Kashgaria, ?Iran. Described from Kirgizian Range. Type in Helsinki; isotype in Berlin.

79. **T. elongatum** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 13 in Fl. Uzb. VI, 471.

Perennial. Leaves 25–35 cm long and 4.0–5.5 cm wide, green, scatteredly arachnoid pubescent on both surfaces, usually undivided, sinuate toothed, with unequal, often deflexed, teeth, less often pinnatilobate or even pinnatipartite with broad-deltoid lateral lobes and longer ovate terminal lobe. Scapes usually one to three, with lax arachnoid hairy tomentum, longer than leaves at flowering time, strongly elongated (two to two and one-half times as long as leaves) in fruit. Involucres medium, involucre bracts herbaceous, outer broadly lanceolate, more or less appressed to inner bracts, greenish, reddish at apex, with short subterminal cornicle, inner bracts oblong-linear, almost two and one-half times as long as longest outer bracts, also with short subterminal cornicle. Florets yellow, peripheral florets with dark stripes on the lower side of ligule, covered with fairly dense long flexuous and short straight hairs on limb and in the upper part of corolla tube. Achenes light brown; body about 3 mm long, covered with acute tubercles in the upper part; cone about 0.5 mm long; beak 7–9 mm long, pappus 5–6 mm long, white. Flowering June to July.

Forest glades, among shrubs, at bottom of gorges in middle mountain zone.—*Soviet Central Asia*: Syr-Darya, Pamiro-Alai (western part). Endemic. Described from valley of Guralash River (Samarkand Region). Type in Tashkent.

80. **T. juzepczukii** Schischk. sp. nova in Addenda XXVIII, 731; Schischk. in Lapin, Opred. Rast. Tashk. Oazisa (1938) 317, diagn. in Russian; Kovalevskaya in Fl. Uzb. VI (1962) 471, diagn. in Russian.

Perennial. Plants 15–30 cm high, with rather thick vertical root; root collar covered with dark brown remnants of dead leaves, subglabrous. Leaves 10–25 cm long and 2.5–7.0 cm wide, glabrous or subglabrous, runcinately pinnatipartite, with more or less deflexed, acuminate, lateral lobes with more or less toothed upper margin and smaller terminal lobe. Scapes usually few, with weak arachnoid pubescence below capitula. Involucres 13–17 mm long at flowering; outer involucral bracts more or less appressed to inner bracts, wider than them, ovate to broadly lanceolate, light green, more or less membranous along margin, without or with short
480 cornicle; inner bracts oblong-linear, two and one-half times as long as longest outer bracts, glaucescent-green, with short subterminal cornicles, cornicles not always distinct or entirely absent. Florets yellow, with short and long hairs in the middle part of corolla, peripheral florets with dark stripe on the lower side of ligule. Achenes light brown; body 3 mm long with fewer longitudinal furrows, with rather numerous, acute, tubercles in the upper half, with only short, obtuse, tubercles below; cone 0.8–1.2 mm long; beak 8–11 mm long; pappus 6–7 mm long, whitish. Flowering April to May.

Meadows, gardens and parks, roadsides, inhabited areas.—*Soviet Central Asia*: Syr-Darya. Endemic. Described from vicinity of Tashkent. Type (Tashkent, Takhtakul, in courtyard of medical school, 29.IV.1932, A. Lapin) in Tashkent; isotype in Leningrad.

81. **T. botschantzevii** Schischk. sp. nova in Addenda XXVIII, 732.

Perennial. Plants with rather thick root; root collar covered with dark brown remnants of dead leaves with small quantity of lax brownish tomentum between bases of their petioles. Leaves 4–12 cm long and 1.0–2.5 cm wide; weakly pubescent on midrib, pinnatipartite or pinnatilobate, with much larger terminal lobe and fewer, long acuminate lateral lobes or lobules, sometimes some undivided, sinuate-toothed. Scapes few usually more or less ascending, almost as long as leaves, more or less covered with lax arachnoid-hairy tomentum mostly in the upper part. Involucres 10–14 mm long, green, outer involucral bracts lanceolate-ovate to lanceolate, more or less deflected from inner bracts (to recurved) and almost as wide, without subterminal or with short obtuse cornicle; inner bracts oblong-linear, two and one-half to three times as long as longest outer bracts, with well developed dark subterminal cornicles. Florets yellow, with wide dark stripe on the lower side of ligule; corolla with scattered short hairs in the middle part. Achenes light brown, body 2.5 mm long, with fewer, acute, tubercles in the upper third; cone about 0.8

mm long; beak 7–8 mm long; pappus about 6 mm long, white. Flowering May to June.

Meadows gravel-beds, roadsides.—*Soviet Central Asia*: Tien Shan (Karatau Range). Endemic. Described from Karatau Range. Type (southern Kazakhstan, Karatau Range, road from village of Baidzhonsai to village of Cholaktau in meadow near Koktal River, 18.VI.1959, No 445, V. Botschantzev) in Leningrad.

82. **T. multiscaposum** Schischk. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII (1937) 8.—**lc.**: Schischk. *ibid.* fig. 2.

481 Perennial. plants 8–20 cm high, with rather thick, often many-headed root; root collar glabrous, weakly hairy. Leaves 3.5–12.0 cm long and 1.0–2.5 cm wide, glabrous or weakly pubescent, runcinately shallow pinnatipartite or pinnatilobate, with wider lobes or lobules, more or less toothed or undivided, sinuate-toothed. Scapes usually four to eight, with weak arachnoid pubescence or glabrous below capitula. Involucres 9–13 mm long; outer involucral bracts ovate to broadly lanceolate, more or less deflexed, almost as wide as inner bracts, light green, without cornicle; inner involucral bracts oblong-linear, two and one-half to three times as long as longest outer bracts, green, without or with few subterminal cornicles. Flowering light yellow; peripheral with wide dark stripe on the lower side of ligule. Achenes light brown, body 2.3–3.0 mm long, with numerous acute tubercles in the upper half, only with short obtuse tubercles below; cone 1.0–1.4 mm long; beak 6–8 mm long; pappus 5–6 mm long, white. Flowering May to July.

Alkalline meadows, alkali soil and cheegrass, roadsides.—*Soviet Central Asia*: Balkhash (southeastern part), Dzhungaria-Tarbagatai, Tien Shan (eastern part). *General distribution*: Probably found in areas bordering China. Described from basin of Kegen River (near village of Sary-Dzhas). Type in Leningrad.

83. **T. lipskyi** Schischk. in Fl. Turkm. VII (1960) 318 and 383.

Perennial. Plants with rather thick vertical root; root collar glabrous or subglabrous. Leaves 7–15 cm long and 1–2 cm wide, glabrous or subglabrous, somewhat glaucous, pinnatipartite, with rather numerous (many) (four to seven on each side), more or less deflexed, often toothed, lateral lobes and small terminal lobe. Scapes glabrous or with occasional (three to eight) hairs below capitula. Involucres 10–14 mm long; outer involucral bracts ovate-lanceolate to lanceolate, more or less deflected from inner bracts at anthesis and almost as wide as inner, later, recurved, membranous, light green, without or with short subterminal cornicle, inner involucral bracts oblong-linear, two and one-half times to three times as long as longest outer bracts, somewhat glabrous green, herbaceous, usually

with short, obtuse, subterminal cornicle. Florets yellow or light yellow (?) with glabrous or subglabrous corolla, peripheral florets with wide dark stripe on the lower side of ligules. Achene light brown; body 2.2–2.8 mm long, covered with numerous acute tubercles almost from the base; cone 1.0–1.3 mm long; beak 8–11 mm long; pappus 5–6 mm long, white. Flowering March to April.

Loamy and stony slopes, roadsides and along irrigation channels, near inhabited areas.—*Soviet Central Asia*: mountainous Turkmenia, Kara-Kum. Endemic. Described from Simbar River Valley near Kara-Kal. Type in Leningrad.

482 84. **T. nikitinii** Schischk. in Fl. Turkm. VII (1960) 319 and 383.

Perennial. Plants 10–25 cm high, with rather thick root. Leaves 8–15 cm long and 1–3 cm wide, with rather long narrow-winged petiole, glabrous or subglabrous, undivided, with fine and short teeth to almost entire. Scapes few, glabrous or weakly arachnoid-hairy below capitula. Involucres 10–15 mm long; outer involucre bracts lanceolate-ovate to lanceolate, at least partly recurved, usually narrower than inner, light green, membranous, with or without indistinct subterminal cornicle, inner involucre bracts oblong-linear, two and one-half to three times as long as longest outer bracts, green, herbaceous, with short but not always distinct subterminal cornicle. Florets light yellow (?), more or less hairy in the middle part of corolla. Achenes light brown, body 3.0–3.5 mm long, with a few longitudinal furrows, covered with acute tubercles in the upper third; cone 0.5–0.8 mm long; beak 7–8 mm long; pappus about 5 mm long, white. Flowering April to May.

Loamy and stony slopes, roadsides.—*Soviet Central Asia*: Amu-Darya, mountainous Turkmenia. Endemic. Described from Turkmenia. Type (Murgab River Valley, Tashkepri, 7.IV.1912, No. 219, V. Lipsky) in Leningrad.

85. **T. comitans** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 12 and in Fl. Uzb VI, 470.

Perennial. Plants with rather thick root; root collar covered with rather numerous brownish remnants of dead leaves, with more or less dense tomentum between bases of their petioles, sometimes almost indistinct. Leaves 5–10 cm long and 0.5–1.0 cm wide, weakly arachnoid pubescent only along midrib, pinnatipartite with narrow deltoid, slightly deflexed, toothed lateral lobes, less often pinnatilobate or undivided, sinuate-toothed. Scapes slender, solitary or few, more or less profusely lax arachnoid-hairy tomentose below capitula, usually glabrous in other parts. Involucres 8–11 mm long; outer involucre bracts more or less deflected from inner, broadly lanceolate to narrowly lanceolate, green, almost without scarious

border, without subterminal coricle; inner bracts oblong-linear, two and one-half to three times as long as longest outer bracts, whitish along margin, membranous, usually with a small, indistinct subterminal coricles. Florets light yellow or yellow(?); peripheral florets with dark stripes on the lower side of ligules, more or less hairy in the middle part of corolla. Achenes light yellowish-brown; body 2.0–2.3 mm long, with rather numerous longitudinal furrows, with numerous acute tubercles in the upper half; cone 0.6–1.0 mm long, indistinctly merged in beak; 6–8 mm long; pappus about 6 mm long, white. Flowering May to June.

483 Alkaline meadows, in tugais, usually with *T. bicornis*.—*Soviet Central Asia*: Syr-Darya, Amu-Darya, Pamiro-Alai (western part). Endemic. Described from Surkhan Darya Region of Uzbek SSR. Type in Tashkent.

86. ***T. monochlamydeum*** Hand.-Mazz. Monogr. Tarax. (1907) 43, p. p.: Hagl. in Bot. Notis. (1938) 309, descr. emend.: Kovalevskaya in Fl. Uzb. VI, 469, p. p.—*T. vernale* Schischk. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII (1937) 7.—*T. turkestanicum* S. Koval. in Fl. Uzb. VI (1962) 469, in syn. —*T. hissaricum* Schischk. ex S. Koval. op. cit. 462, diagn in Russ.—**lc.**: Hand.-Mazz. op. cit. t. 1, fig. 16

Perennial. Plants 6–20 cm high, with slender root; root collar covered with fewer brownish remnants of dead leaves, glabrous or with fewer long flexuous hairs in axil of petioles. Leaves glabrous or subglabrous, often glaucous-green, 6–16 cm long and 1.5–4.0 cm wide, runcinately or lyrate pinnatifid, less often pinnatifid, with more or less reflexed often toothed lateral lobes, usually with intermediate lobules or teeth, or often without them. Scapes more or less arachnoid pubescent below capitula, often subglabrous. Involucres 8–14 mm long, green; outer involucral bracts ovate to broadly lanceolate, not closely appressed to inner bracts or more or less deflected to recurved, almost as wide as inner bracts or wider than them, with or almost without narrow scarious border, without or with short and indistinct subterminal coricle; inner involucral bracts oblong-linear, two and one-half to three times as long as outer bracts, with or without short subterminal coricles. Florets light yellow; peripheral florets with dark stripes on lower side of ligules; corolla with short straight hairs in the middle part. Achenes light brown, body 2.5–3.0 mm long, covered with numerous acute tubercles in the upper half, only with short, obtuse tubercles below; cone 1.0–1.3 mm long; beak 6–9 mm long; pappus about 5 mm long, white. Flowering April to May.

Loamy and stony slopes, gravel-beds, gardens and parks, roadsides and along irrigation channels, near inhabited area; in mountains to middle mountain zone.—*Soviet Central Asia*: Aralo-Caspian (southeastern part), Balkhash, Dzhungaria-Tarbagatai, Tien Shan, Syr-Darya, Amu-Darya,

KyzylKum, Pamiro-Alai. *General distribution*: Afghanistan, Pakistan, India (northern part), Iran and Iraq. Described from Soviet Central Asia (near Samarkand). Lectotype in Copenhagen.

Note. It is a highly polymorphic species. The most typical specimens have runcinately pinnatipartite leaves with a small terminal lobe. Specimens with lyrate leaves, on the basis of which *T. vernale* Schischk. has been described from the vicinity of Chimkent, are linked with this species through transitional forms.

87. ***T. praecox*** Schischk. sp. nova in Addenda XXVIII, 732; Schischk. in Lapin, Opred. Rast. Tashk. Oazisa (1938) 316, Diagn. in Russ.
484 —*T. monochlamydeum* Hand.-Mazz. Monogr. Tarax. (1907) 43, p. p.: Kovalevskaya in Fl. Uzb. VI, 469, p. p.

Perennial. Plants 5–15 cm high, with slender root; root collar covered with fewer brownish remnants of dead leaves and usually with long flexuous hairs in their axils. Leaves glabrous or subglabrous, 5–15 cm long and 8–20 mm wide, deeply pinnatipartite with rather numerous, more or less narrowed at base, often toothed, lateral lobes; with much smaller intermediate lobules and teeth, and larger terminal lobe. Scapes with weak arachnoid pubescence below capitula, usually subglabrous. Involucres 10–12 mm long, dark green; outer involucral bracts ovate to lanceolate-ovate, more or less appressed to inner bracts, almost as long [? wide] as inner bracts or slightly wider than them, more or less ciliate, without coracle; inner involucral bracts oblong-linear, three to three and one-half times as long as longest outer bracts, without or with indistinct cornicles. Florets light yellow; peripheral florets with dark stripe on the lower side of ligules. Achenes not known. Flowering March to April.

Loamy and sandy slopes, gardens and roadsides.—*Soviet Central Asia*: Syr-Darya. Endemic. Described from vicinity of Tashkent. Type (in garden of former Turkestan Agricultural Station near Tashkent, 11.II,1903, collector unknown) and isotype in Leningrad; isotype in Tashkent.

Note. It differs from the similar species *T. monochlamydeum* Hand.-Mazz. by the shape of the leaves, the dark green (almost blackish) involucres, and also by very early flowering.

88. ***T. holophyllum*** Schischk. sp. nova in Addenda XXVIII, 733; Schischk. in Lapin, Opred. Rast. Tashk. Oazisa (1938) 316, diagn. in Russ.—*T. monochlamydeum* Hand.-Mazz. Monogr. Tarax. (1907) 43, p. p.; Kovalevskaya in Fl. Uzb. VI, 469, p. p.

Perennial. Plants 4–12 cm high, with rather thick root. Leaves glabrous or subglabrous, 3–8 cm long and 8–18 mm wide, undivided, more or less sinuate-toothed to entire, obtuse. Scapes two or three, more or less arachnoid pubescent below capitula. Involucres 9–12 mm long, dark green;

outer involucre bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts or partly recurved, without cornicles; inner bracts oblong-linear, two and one-half to three times as long as longest outer bracts, without or with indistinct cornicles. Florets light yellow. Achenes not known. Flowering March to April.

Clayey slopes, gardens and parks, roadsides.—*Soviet Central Asia*: Syr-Darya, Tien Shan (western part). Endemic. Described from the vicinity of Tashkent. Type (Schreder Orchard-Vegetable Experiment Station near Tashkent, collector unknown) in Leningrad; isotype in Tashkent.

Note. It differs from the similar species *T. monochlamydeum* Hand.-Mazz by its undivided, more or less toothed or entire leaves and dark green (almost blackish) involucre.

485 89. ***T. maracandium*** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 10 and in Fl. Uzb. VI, 465.

Perennial. Plants with rather thick, often many-headed root. Leaves 20–30 cm long and 2.5–4.5 mm wide, subglabrous, usually runcinately pinnatipartite, with more or less deflexed, unequal lateral lobes, often with more or less toothed upper margin, and usually larger terminal lobe. Scapes almost as long as leaves at anthesis, with very weak arachnoid pubescence below capitula. Involucre 12–15 mm long, dark green, outer involucre bracts more or less appressed to inner and almost as wide as inner, lanceolate-ovate to lanceolate, dark green, with narrow scarious border, without or with small and dark colored cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, usually with small and not always well-developed subterminal cornicle. Florets yellow, with long and short hairs in the middle part of corolla; peripheral florets with dark stripes on the lower side of ligule. Achenes light brown; body 3.0–3.5 mm long, covered with acute tubercles in the upper half, only with obtuse tubercles below; cone 1.0–1.2 mm long; beak 10–11 mm long; pappus about 6 mm long, white. Flowering April.

Herb slopes, roadsides and along irrigation channels, gardens and parks.—*Soviet Central Asia*: Syr-Darya, Amu-Darya, Pamiro-Alai (western part). Endemic. Described from Samarkand. Type in Tashkent; isotype in Leningrad.

90. ***T. strobilocephalum*** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 11 and in Fl. Uzb. VI, 466.

Perennial. Plants 5–20 cm high, with slender root; root collar glabrous. Leaves 5–20 cm long and 1–4 cm wide; glabrous, green, runcinately pinnatipartite with wide deltoid, entire or irregularly toothed lateral lobes and usually larger terminal lobe. Scapes with lax arachnoid-hairy tomentum

below capitula. Involucres rather large; outer involucre bracts broadly ovate to ovate, appressed to inner bracts and much wider than them, light green, with narrow scarious border, abruptly narrowed at the apex with small, dark, cornicles or partly without them; inner involucre bracts oblong-linear, green, two to two and one-half times as long as longest outer bracts, without cornicles. Florets yellow, with occasional short hairs in the middle part of corolla; peripheral florets with dark stripe on the lower side of ligule. Achenes light brownish-gray; body 3.0–3.5 mm long, covered with acute tubercles in the upper half, only with short obtuse tubercles below; cone about 1 mm long; beak 10–11 mm long; pappus about 6 mm long, white. Flowering April.

Gardens and parks, roadsides and along irrigation channels.—*Soviet Central Asia*: Syr-Darya, Pamiro-Alai (western part). Endemic. Described from Tashkent. Type in Tashkent.

486 91. **T. nuratavicum** Schischk. sp. nova in Addenda XXVIII, 733.

Perennial. Plants 5–16 cm high, with rather thick, often many-headed root; toot collar covered with brownish remnants of dead leaves, usually with a small quantity of brownish tomentum in their axil. Leaves 5–12 cm long and 1.5–3.0 cm wide, glabrous green, more or less covered with scattered flexuous hairs to subglabrous, runcinately pinnatifid with two to four, more or less deflexed lobes, often with toothed anterior margin. Scapes scatteredly arachnoid pubescent, with lax arachnoid-hairy tomentum below capitula. Involucre 9–14 mm long; outer involucre bracts broadly lanceolate to lanceolate, more or less deflected from inner bracts (to recurved) and slightly narrower than them, scarious, light green, without cornicles; inner involucre bracts oblong-linear, usually two and one-half times as long as longest outer bracts, green, with or without very short, indistinct, subterminal cornicle. Florets yellow or light yellow(?), short-hairy in the middle part of corolla; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body about 3.5 mm long, with few longitudinal furrows, with acute tubercles in the upper half or third; cone 0.6–0.8 mm long, well separated; beak 7–8 mm long; pappus 5–6 mm long, white. Flowering May to June.

Stony and loamy slopes, gravel-beds, grassy patches in middle and upper mountain zones.—*Soviet Central Asia*: Amu-Darya, Pamiro-Alai (western part). Endemic. Described from Nuratau Range. Type (Nuratau Range, Aktau Mountains, upper reaches of Tutak Sai*, 4.VI.1951. No. 103, O. Neustrueva and L. Tszvetkova) in Leningrad..

92. **T. nevskii** Juz. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, IV (1937) 293; Schischk. in Fl. Turkm. VII, 318.

* Sai—a valley, sometimes very broad—General Editor.

Perennial. Plants 5–20 cm high, with rather thick, often many-headed root; root collar sparsely hairy. Leaves 6–17 cm long and 8–25 cm wide, glabrous or subglabrous, runcinately pinnatipartite; with more or less retrorse, often large-toothed, lateral lobes and small terminal lobe. Scapes few, with weak arachnoid pubescence only below capitula. Involucre 10–15 mm long, light green; outer involucre bracts lanceolate-ovate to broadly lanceolate, more or less deflected from inner bracts (to recurved) and usually slightly wider than them, scarious with distinct venation, with small but distinct subterminal cornicle, inner bracts oblong-linear, usually two and one-half times as long as longest outer bracts, with or without small subterminal cornicles. Florets light yellow, with few very short hairs in the middle part of corolla; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body about 3.5 mm long, with fewer longitudinal furrows, covered with larger but fewer, acute, tubercles in the upper fourth; cone 0.6–0.8 mm long, well separated; beak 7–9 mm long; pappus about 6 mm long, white. Flowering June to July.

Stony and rubbly slopes, taluses, gravel-beds, mostly in middle mountain zone.—*Soviet Central Asia*: mountainous Turkmenia, Amu-Darya, Pamiro-Alai (western part). Endemic? Described from Kugitang Range. Type in Leningrad.

93. **T. microspermum** Schischk in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII (1937) 10.—**Ic.**: Schischk. *ibid.* fig. 3.

Perennial. Plants 6–25 cm high, with thicker root; root collar covered with dark brown remnants of dead leaves, with a few long flexuous hairs in their axil. Leaves 5–12 cm long and 5–25 mm wide, glabrous or weakly pubescent, runcinately pinnatipartite, with deltoid, more or less or retrorse, acute, lateral lobes and larger terminal lobe. Scapes two to six, more or less arachnoid pubescent below capitula. Involucres 9–13 mm long; outer involucre bracts ovate to broadly lanceolate, somewhat wider than inner bracts and more or less appressed to them, light green, often pinkish tinge along margin and at the apex, without cornicles; inner bracts oblong-linear, usually two and one-half times as long as longest outer bracts, dark green, without or with indistinct subterminal cornicle. Florets yellow or light yellow(?); peripheral florets with dark wide stripe on the lower side of ligule. Achene light brown; body about 3 mm long, with acute tubercles in the upper part, smooth in the lower part; cone 0.6–1.0 mm long; beak 7–8 mm long; pappus 5–6 mm long. Flowering June.

Wet alkaline meadows, on gravel-beds.—*Soviet Central Asia*: Balkhash Region (southern part), Dzhungaria-Tarbagatai, Tien Shan (eastern part). *General distribution*: Probably found in regions bordering China. Described from Tekes River Valley. Type in Leningrad.

94. **T. aschabadense** Schischk. in Fl. Turkm. VII (1960) 382.

Perennial. Plants with rather thick vertical root. Leaves 10–25 cm long and 2.0–3.5 cm wide, runcinately pinnatipartite or pinnatilobate with more or less deflexed, usually small-toothed lobes, glabrous or subglabrous. Scapes few, longer than leaves or almost as long, covered with lax tomentum only below capitula. Involucre 12–16 mm long, light green; outer involucral bracts more or less deflexed, almost as wide as inner bracts, from ovate, apically more or less attenuate to ovate-lanceolate, scarious, with or entirely without indistinct subterminal cornicle; inner involucral bracts often two and one-half times as long as longest inner
 488 [sic., outer] bracts, herbaceous, oblong-linear, apically usually with distinct but short cornicles. Florets yellowish, with corolla more or less hairy in the middle part. Achenes light yellowish-brown; body 3.0–3.6 mm long, with numerous acute tubercles almost from the base; cone 0.5–0.8 mm long; beak about 10 mm long; pappus 5.0–6.5 mm long, white. Flowering April to May.

Desert steppes.—*Soviet Central Asia*: mountainous Turkmenia. Endemic. Described from vicinity of Ashkhabad. Type and isotype in Leningrad.

95. **T. tadshicorum** Ovcz. sp. nova in Addenda XXVIII, 734; Ovczinnikov in Soobshch. Tadjh. Fil. Akad. Nauk SSSR, 1 (1947) 3 diagn. in Russ.

Perennial. Plants with rather thick, often many-headed root; root collar covered with brown remnants of dead leaves, with small quantity of lax brownish tomentum in their axils. Leaves 10–20 cm long and 2.0–3.5 cm wide, basally narrowed into narrow-winged petiole, green, subglabrous, irregularly sinuate-toothed. Scapes 8–25 cm long, slender, three to eight, only with a few long flexuous hairs below capitula. Involucre 12–18 mm long; outer involucral bracts broadly ovate to lanceolate-ovate, more or less recurved, somewhat wider than inner bracts, light green, with very narrow scarious margin and a distinct network of veins, without or with small subterminal cornicle; inner bracts oblong-linear, about two and one-half times as long as longest outer bracts, green, often with small subterminal cornicle, partly without them. Florets yellow, with scattered short hairs in the middle part of corolla; peripheral florets with dark brown stripe on the lower side of ligule. Achenes light brownish-green; body about 2.5 mm long with small longitudinal furrows, covered with rather long, acute, tubercles in the upper third; only with a few short and obtuse tubercles below; cone 0.8–1.0 mm long; beak 8–11 mm long; pappus about 5 mm long, white. Flowering April to August.

Stony and clayey slopes of lower and middle mountain zones.—*Soviet Central Asia*: Pamiro-Alai (western part). Endemic. Described from Hissar Range. Type (Tadjhikistan, Hissar Range, Makhrinava District,

Shomalik, alt. 1,600 m, 10.VIII.1947. P. Ovczinnikov and M. Nadyrov) in Leningrad.

96. **T. karatavicum** Pavl. sp. nova in Addenda XXVIII, 734; Pavl. in Pavl. and Lipsch. in Sov. Bot. 1 (1934) 29, nom. nud.

Perennial. Plants 10-35 cm high, with rather thick root; root collar covered with dark brown remnants of dead leaves, with more or less profuse brownish tomentum of long flexuous hairs in their axil. Leaves subglabrous, 10-25 cm long and 1.5-3.5 cm wide, with rather long, narrow-winged petiole, usually undivided, sinuate-toothed, less often pinnatilobate or even pinnatipartite with more or less deflexed, often toothed lobes. Scapes few, only with a small quantity of lax arachnoid-hairy tomentum below capitula. Involucres 12-15 mm long at flowering time, glaucescent-green; outer involucre bracts lanceolate-ovate to lanceolate, more or less deflected from inner bracts to recurved, almost as wide as inner bracts and thinner than them, without or with short and indistinct subterminal cornicle; inner bracts oblong-linear, usually two and one-half times as long as longest outer bracts, with short but well-developed subterminal cornicle. Florets yellow or light yellow (?), with short hairs in the middle part of corolla; peripheral florets with wide dark stripe on the lower side of ligules. Achenes light brown; body 2.5-2.8 mm long, with rather numerous acute tubercles in the upper half, terminating in shorter obtuse tubercles below; cone about 0.6 mm long, well separated from the beak and achene body; beak 9-10 mm long; pappus about 6 mm long, white. Flowering April to May.

Meadows, stony slopes, gravel-beds.—*Soviet Central Asia*: Tien Shan (Karatau Range). Endemic. Described from Karatau Range. Type (Karatau Range, slope below Bukui-tau Peak, 1.VII.1931, No. 478, N. Pavlov) in Moscow; isotype in Leningrad.

97. **T. longipyramidatum** Schischk. sp. nova. in Addenda, XXVIII, 735.

Perennial. plants 10-40 cm high with rather thick vertical root. Leaves 12-25 cm long and 3-6 cm wide, glabrous or subglabrous, from undivided, unevenly sinuate-toothed to pinnatipartite with wide, more or less toothed, lateral lobes and larger terminal lobe. Scapes few, usually only with fewer flexuous hairs below capitula. Involucres 13-18 mm long at flowering time; outer involucre bracts more or less appressed, later (at the end of anthesis) more or less separated to recurved, ovate to lanceolate-ovate, slightly wider than inner, somewhat glaucous-green without or with few cornicles; inner involucre bracts oblong-linear usually two times as long as longest outer bracts, without or with short obtuse subterminal cornicle. Florets yellow(?), with profusely short-hairy middle part of corolla, with

wide dark stripe on the lower side of ligule. Achenes light yellowish-brown; body about 3 mm long, tubercles from the base, tubercles acute in the upper part, mostly obtuse in the lower part; cone 1.2–1.8 mm long; beak 8–10 mm long; pappus about 7 mm long, white. Flowering May

Alkaline meadows, among cheegrass stands.—*Soviet Central Asia*: Balkhash Region (southern part), Tien Shan (northern foothills). Endemic. Described from vicinity of Alma-Ata. Type (Alma-Ata Region, near Chemolgan Station, 28.V.1932. A. Geld) in Leningrad.

- 490 98. **T. neo-lobulatum** Van Soest in Acta Bot. Neerland. IX (1960) 305.—*T. lobulatum* Bomm. ex Dahlst. in Acta Hort. Berg. IX (1926) 32; Schischk. in Grossh. Fl. Kavk. IV (1934) 249; Grossh. Oprod. Rast. Kavk. (1949) 513; Sofieva in Fl. Azerb. VIII, 538; non Brenner (1907). —**lc.**: Dahlst. op. cit.

Perennial. Plants 3–7 cm high, with rather thick, often many-headed root; root collar covered with brownish remnants of dead leaves, with more or less profuse brownish tomentum of long flexuous hairs in their axil. Leaves 1.5–5.0 cm long, subglabrous, deeply pinnatipartite, lateral lobes often basally narrowed, entire, usually more or less subotuse, four to nine on each side; terminal lobe somewhat larger, often with small intermediate lobules. Scapes with few flexuous hairs only below capitula. Involucres 9–11 mm long; outer involucral bracts broadly lanceolate to lanceolate, more or less appressed to inner bracts and almost as wide as latter, scarious, light green with more or less long subterminal cornicle or partly without cornicle; inner bracts oblong-linear, two and one-half times as long as longest outer bracts, with more or less long subterminal cornicle or partly without them. Florets light yellow, with scattered short hairs in the middle part of corolla, often with dark stripes on the lower side of ligule. Achenes light yellowish-brown; body 2.5–3.0 mm long, with rather numerous longitudinal furrows, with acute tubercles along ribs mostly in the upper half, rather gradually terminating into 0.7–1.0 mm long cone, but very sharply separated from beak; beak 6–7 mm long; pappus about 5 mm long, white. Flowering April to May.

Clayey and stony slopes of middle mountain zone.—*Caucasus*: ?Southern Transcaucasia, Talysh. *General distribution*: Iran. Described from Iran. Type in Vienna; isotypes in Leningrad and many other herbaria around the world.

99. **T. butkovii** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 8 and in Fl. Uzb. VI, 462.

Perennial. Plants with rather thick root; root collar covered with dark remnants of dead leaves. Leaves 4–7 cm long and 1.0–1.5 cm wide, pinnatipartite, green, glabrous or with weak arachnoid pubescence; lateral

lobes numerous, lanceolate, irregularly toothed on the upper (and less often also on lower) margin, usually deflexed; terminal lobe roughly one-fifth as long as lamina, acute, irregularly sinuate-toothed. Scapes slender, slightly longer than leaves at flowering time, with lax arachnoid tomentum only below capitula. Capitula medium; involuclral bracts herbaceous, green, glabrous or subglabrous, with rather large subterminal cornicle; outer involuclral bracts broadly lanceolate, somewhat deflected from inner bracts, almost without scarious border; inner bracts two to two and one-half times as long as longest outer bracts, oblong-linear, with narrow membranous margin. Florets yellow turning pink after flowering (?), covered with dense but short hairs in the lower part of limb of corolla and in the upper part of tube. Achenes light yellowish brown, body 4.5–5.0 mm long, covered with acute tubercles in the upper third; cone about 1 mm long; beak 6.5–8.0 long; pappus about 6 mm long, white. Flowering July.

Red clay outcrops in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (northwestern part). Endemic. Described from Surkhan Darya Region, Uzbek SSR. Type in Tashkent.

100. **T. kok-saghyz** Rodin in Tr. Bot. Inst. Akad. Nauk SSSR. Ser. 1, 1 (1933) 187; Klovov in Vizn. Rosl. URSR (1950) 593; Mikhailovskaya in Fl. BSSR, V, 184.—**lc.**: Rodin op. cit. Fig. 1.—**Exs.**: GRF No. 3800.

Perennial. Plants with rather thick, vertical or more or less ascending root; root collar covered with numerous dark brown remnants of dead leaves. Leaves numerous, glabrous, 2.5–10.0 cm long and 0.5–3.0 cm wide, undivided, obtuse or subacute, shallow-toothed or entire. Scapes many, slightly larger than leaves, with small quantity of ochreous arachnoid-hairy tomentum below capitula. Involucres 8–11 mm long, pale green; outer involuclral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts as wide as or slightly wider than them, herbaceous, with well-developed subterminal cornicle; inner involuclral bracts oblong-linear, about one and one-half times as long as longest outer bracts, herbaceous, with long and acute dark colored subterminal cornicle. Florets yellow, with scattered short hairs in the middle part of corolla. Achenes light brown; body 2.5–3.0 mm long, with numerous (12–17) longitudinal furrows, with rather numerous acute tubercles in the upper third or half; cone 1.0–1.8 mm long; beak 5–6 mm long; pappus 4–5 mm long, white. Flowering June to July.

Alkaline meadows, gravel-beds, cheegrass stands.—*Soviet Central Asia*: Tien Shan (eastern part), Dzhungaria-Tarbagatai. *General distribution*: Possibly found in areas bordering China. Described from Kegen River Valley. Type in Leningrad.

Economic Importance. The milky sap (latex) of “kok-sagyz” contains a relatively high percentage of high-quality rubber. According to the

Bolshaya Sovetskaya Entsiklopedia [The Great Soviet Encyclopedia] (Vol. 21, 1953), converted to dry weight, first-year roots contain 10–12% rubber and second-year roots 11–14%. The leaves of “kok-sagyz” contain much less rubber (up to 0.5%). As a rubber-yielding plant this species was discovered in 1931 by V. Spivachenko and V. Bukhanovich and later extensively introduced into cultivation in many areas of our country. At present, the cultivation of “kok-sagyz” has been discontinued, but this species may be found in the wild, in areas where it was cultivated earlier. Extensive literature is available on “kok-sagyz” (about its cultivation, biology, etc.).

101. **T. brevicorniculatum** V. Korol. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VIII, 6 (1940) 93.—**Ic.:** V. Korolev, *ibid.* Fig. 2.

Perennial. Leaves runcinately pinnatilobate or pinnatipartite, with much wider terminal lobe or segment and relatively fewer lateral lobes; lateral lobes more or less toothed. Scapes several. Involucres 12–15 mm long, pale yellow; outer involucral bracts ovate to broadly lanceolate, not closely appressed to inner bracts and much wider than them, with short, acute, subterminal cornicle; inner bracts oblong-linear, one and one-half times as long as longest outer bracts, with short subterminal cornicle. Florets yellow, with darker lilac stripe on the lower part of ligules. Achenes light brownish-gray; body 3.5–4.5 mm long, with numerous acute tubercles almost from the base; cone 0.6–1.0 mm long beak; beak 7–8 mm long; pappus 6–7 mm long, white. Flowering July.

Alkaline meadows.—*Soviet Central Asia:* Tien Shan (eastern part), Dzhungaria-Tarbagatai. *General distribution:* Possibly found in areas bordering China. Described from Tekes River Valley. Type in Leningrad (Herbarium of the All-Union Institute of Plant Industry).

Note. It is found in the natural habitats of “kok-sagyz” (*T. kok-saghyz*) and is one of the dandelions that in the past was a weed in kok-sagyz” crops.

102. **T. pseudo-dissimile** Van Soest in Acta Bot. Neerland. IX (1960) 309.—**Ic.:** Van Soest, *ibid.* Fig. 6.

Perennial. Plants 5–10 cm high, with rather thick root; root collar glabrous. Leaves 5–10 cm long and 8–25 mm wide, glaucous-green, subglabrous, usually runcinately pinnatipartite, with more or less deflexed, often more or less toothed, lateral lobes, three to six on each side, and larger terminal lobe. Scapes with weak arachnoid-puescence below capitula, subglabrous. Involucral 10–15 mm long, pale yellow; outer involucral bracts separated to recurved, broadly lanceolate to lanceolate, with wide scarious border and more or less pinkish in the upper part, without cornicle; inner bracts oblong-linear, dark colored in the upper

part, without cornicle. Florets yellow; peripheral with dark stripes on the lower side of ligules. Achenes light yellowish-brown; body about 3.5 mm long, covered with acute tubercles in the upper part, rather gradually terminating into cylindrical, 1.5–2.0 mm long cone; beak about 7 mm long; pappus about 5 mm long, whitish. Flowering June to July.

493 Stony and clayey slopes, gravel-beds in middle and upper mountain zones.—*Soviet Central Asia*: Pamiro-Alai. *General distribution*: Iran, Afghanistan. Described from Iran, Type in Vienna.

Note. This recently described species is reported from Tadzhikistan (near the village of Bordab) by the author. Its systematic position, like that of the next species, is not quite clear to me.

103. **T. longirostre** Schischk. sp. nova in Addenda XXVIII, 735.

Perennial. Plants 10–25 cm high, with rather thick, sometimes many-headed root. Leaves 6–15 cm long and 7–25 mm wide, green, with weak glabrous tinge, subglabrous, from undivided, irregularly sinuate-toothed to pinnatipartite with more or less deflexed, often toothed lateral lobes, and much larger and toothed terminal lobe. Scapes several, usually only with few flexuous hairs below capitula. Involucres 12–16 mm long; outer involucral bracts ovate to broadly lanceolate, more or less deflected from inner bracts to recurved, slightly wider than inner, light green, without or with indistinct cornicles; inner bracts oblong-linear, usually two times as long as longest outer bracts, green, with or without indistinct subterminal cornicle. Florets yellow. Achenes light brown; body about 3.5 mm long, covered with acute tubercles in the upper half, only with few obtuse tubercles below; cone about 1 mm long; beak 8–11 mm long; pappus 5–6 mm long, white. Flowering June to July.

Alkaline meadows in middle and upper mountain zones.—*Soviet Central Asia*: Pamiro-Alai (western part). Endemic. Described from Hissar Range. Type (southern slope of Hissar Range, right bank of Kafirnigan River, basin of Dzhur-Yaz River, 1.5 km north of Darvaz Pass, 20:VII.1939, No. 115, K. Afanasev) and isotype in Leningrad.

Subsection 6. Obliqua (Dahlst.) Schischk. comb. nova. —*Taraxacum* grex *Obliqua* Dahlst. in Lindm. Svensk. Fanerogamfl. ed. 2 (1926) 561. —*T. grex dissimilia* Dahlst. in Kungl. Sc. Vet. Akad. Handl. VI, 3 (1928) 3. — *T. sect erythrocarpa* Hand.-Mazz. Monogr. Tarax. (1907) 103, p. p.— Medium or small plants of valleys or lower hills, with more or less thick root, flowering usually in May–June, root collar glabrous or subglabrous. Leaves always pinnatipartite. Scapes glabrous or with lax tomentum below capitula. Involucral bracts at least partly with small subterminal cornicle, very rarely without; outer involucral bracts fewer,

appressed to inner or more or less separated; inner bracts one and one-half to two and one-half times as long as longest outer bracts. Florets yellow or light yellow. Achenes light brown; body 2–3 mm long, with numerous acute tubercles in the upper half, abruptly terminated into 0.5–
 494 1.3 mm long cone; beak 6–10 mm long, always more than two times as long as the achene body.

Type of subsection *T. obliquum* (Fr.) Dahlst.

104. ***T. obliquum*** (Fr.) Dahlst. in Bot. Notis. (1905) 152; Hand.-Mazz. Monogr. Tarax. (1907) 116; Schischk. in Fl. Yugo-Vost. VI, 463. —*Leontodon obliquus* fr. Novit. fl. Suec. (1814) 13 and ed. 2 (1828) 243.

Perennial. Plants 5–15 cm high, with rather thick root; root collar covered with dark brown remnants of dead leaves, glabrous or sparsely hairy. Leaves 4–12 cm long and 6–15 mm wide, glabrous or subglabrous, deeply pinnatifid, with more or less deflexed, entire or subentire lateral lobes, four to seven on each side, and with small terminal lobe, often with intermediate lobules between lateral lobes. Scapes usually more or less ascending, entirely glabrous. Involucres 9–12 mm long; outer involucral bracts broadly ovate to broadly lanceolate, appressed to inner bracts, slightly wider than them, or almost as wide, somewhat glaucous-green, with very narrow scarious border, with or without small, obtuse subterminal cornicles; inner involucral bracts oblong-linear, usually two and one-half times as long as longest outer bracts, with small, obtuse subterminal cornicle, less often without. Florets light yellow, peripheral florets with wide dark stripe on the lower side of ligule; achenes brownish; body 2.5–3.0 mm long, with rather numerous longitudinal furrows, more or less covered with acute tubercles in the upper half, only with short obtuse tubercles below; cone about 0.8 mm long; beak 6.5–8.0 mm long; pappus about 5 mm long, whitish, sometimes with brownish tinge. Flowering May to June.

Meadows, especially the more or less alkaline ones in more northern areas, predominantly near seacoast and shores of large lakes.—*European Part*: Ladoga-Illmen (rarely), Baltic Region, Upper Dnieper, Volga-Kama (southern part), Volga-Don, Middle Dnieper, Upper Dniester, Bessarabia, Lower Don, Lower Volga, Trans-Volga; *Western Siberia*: ?Upper Tobol. *General distribution*: Scandinavia, Atlantic and central Europe, western Mediterranean, Balkans-Asia Minor. Described from Sweden. Type in Stockholm.

105. ***T. xerophilum*** Markl. in Acta bot. fennica XXIII (1938) 87. —
 Ic.: Markl. ibid. fig. 6.—*Exs.*: Eston. pl. No. 184.

Perennial. Plants 3–8 cm high, with rather thick root. Leaves 2.5–8.0

cm long and 5–12 mm wide, subglabrous, green, runcinately pinnatipartite or pinnatilobate, with deflexed lateral lobes having often more or less toothed anterior margin and usually larger terminal lobe. Scapes with rather profuse arachnoid-hairy tomentum below capitula. Involucres 9–14 mm long, green; outer involucral bracts ovate to broadly lanceolate, more or less deflected from inner bracts (to recurved) and slightly wider
 495 than them, with whitish or pinkish scarious border and few flexuous hairs, at least partly with small dark colored subterminal cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, all or partly with small but often subacute dark subterminal cornicle. Florets light yellow; peripheral florets with wide dark stripe on the lower side of ligules. Achenes light brown; body 2.5–2.6 mm long, with rather numerous longitudinal furrows, with long acute tubercles in the upper half, only with short obtuse tubercles and with very fine spicules below; cone about 1 mm long; beak 8–10 mm long; pappus about 5 mm long, sometimes with weak brownish tinge. Flowering May to June.

Dry herb slopes, sand dunes near seacoast.—*European Part*: Baltic Region. Described from Estonia (from Saaremaa Island). Type in Tartu.

106. **T. dissimile** Dahlst. in Arkiv för Botanik. X, 11 (1911) 8; Markl. in Acta bot. fennica XXIII (1938) 36.

Perennial. Plants with rather thick root. Leaves light green, with weak arachnoid pubescence or subglabrous, runcinately pinnatipartite, with more or less deflexed lateral lobes having entire or toothed anterior margin and slightly larger terminal lobe, often with intermediate lobules and teeth. Scapes many, with weak arachnoid pubescence below capitula, often subglabrous. Involucre small, green; outer involucral bracts lanceolate-ovate to lanceolate, not closely appressed to inner bracts, or more or less separate, with distinct scarious border, more or less pinkish-violet in the upper part, without or with small cornicle; inner involucral bracts oblong-linear, one and one-half times as long as longest outer bracts, usually with small cornicle, less often without. Florets yellow; peripheral florets with reddish stripe on the lower side of ligules. Achenes brownish-gray; body 2.0–2.4 mm long, covered with acute tubercles in the upper half; cone 1.0–1.3 mm long; beak 6–7 mm long; pappus whitish. Flowering May to June.

Dry meadows, herb slopes, sand dunes.—*European Part*: Baltic Region, Ladoga-Ilmen. *General distribution*: Scandinavia. Described from Sweden. Type in Stockholm.

Note. A very similar species—*T. microlobum* Markl. (in Acta bot. fennica, XXIII (1938) 84)—has been reported from Estonia. It is distinguished by a shorter (0.7–1.0 mm long) cone of the achenes and much shorter and shorter-acuminate leaf lobes. Another very similar species,

endemic to Estonia, is *T. stellare* Markl. (ibid., p. 85), which has, unlike other species related to it, normally developed pollen. Moreover, one more as yet unpublished species, *T. pseudofulvum* Lindb. fil ex Markl. (ibid. p. 41), which is related to *T. dissimile*, has been reported from Estonia (south of Lake Pskov). This group of species as a whole ("*Dissimilia*" Dahlst.) occupies a seemingly intermediate position between species of the subsections *Erythrosperma* and *Obliquum*, being more similar in many characters to the species of the former subsection, but in the color of their achenes, to the species of the latter subsection. Moreover, species of this group often do not have cornicles on the involucre bracts.

107. *T. stenolobum* Stschegl. in Bull. Soc. Nat. Mosc. XXVII (1854) 180; Schischk. in Kryl. Fl. Zap. Sib. XI, 3006. —*T. obliquum* auct. non Dahlst.; Hand.-Mazz. Monogr. Tarax (1907) 116, p. p.

Perennial. Plants with rather thick, often many-headed root; root collar glabrous or subglabrous. Leaves 6–15 cm long and 8–22 mm wide, glabrous or subglabrous, green, with long narrow-winged petioles, deeply pinnatipartite, with rather narrow, more or less deflexed lateral lobes, entire or toothed on anterior margin and small terminal lobe, usually with small intermediate lobules and teeth between lobes. Scapes 10–20 cm long, glabrous or with occasional flexuous hairs below capitula. Involucres 9–13 mm long; outer involucre bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts, and almost as wide as latter, membranous, light green, with wide, often more or less pinkish, scarious border, with small subterminal cornicle or some without them; inner involucre bracts oblong-linear, one and one-half to two times as long as longest outer bracts, green, often with glaucous tinge, with or without small subterminal cornicle. Florets light yellow with almost glabrous corolla, peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brownish-gray, body 2.5–3.0 mm long, with fewer longitudinal furrows, with numerous acute tubercles in the upper third; cone 0.5–0.8 mm long; beak 7–10 mm long; pappus about 6 mm long, whitish. Flowering May to April [sic., recte May to June]; fruiting September.

Wet, usually more or less alkaline meadows, gravel-beds, in chegrass stands.—*Western Siberia*: Altai, Irtysh (eastern part). Endemic. Described from Altai. Type and its duplicate in Leningrad.

108. *T. printzii* Dahlst. in Printz, Veget. Siber.-Monogl. Front. (1921) 439.—*Ic.*: Dahlst. ibid. t. 16.

Perennial. Plants 10–25 cm high, with rather thick root. Leaves 10–20 cm long and 1.5–4.0 cm wide, pale green, glabrous or subglabrous, runcinately pinnatipartite with more or less deflexed lateral lobes, entire or more or less toothed on anterior margin, long-acuminate, three to six

on each side, and small terminal lobe, often with intermediate lobules and teeth between lobes. Scapes more or less arachnoid pubescent below capitula. Involucre 13–18 mm long, pale green; outer involucre bracts ovate-lanceolate to lanceolate, not closely appressed to inner bracts and almost as wide as inner, more or less pinkish in the upper part, with or
 497 without small subterminal cornicle; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, usually with small subterminal cornicle. Florets yellow (?); peripheral florets with dark stripe on the lower side of ligules. Achenes light yellowish-green; body about 2.5 mm long, covered with acute tubercles in the upper part; cone about 1 mm long; beak 7–8 mm long; pappus white. Flowering May to June.

Meadows, herb slopes gravel-beds.—*Eastern Siberia*: Angara-Sayans. Endemic (?). Described from islands in Abakan River Valley. Type in Oslo (?).

109. **T. desertorum** Schischk. in Grossh. Fl. Kavk. IV (1934) 251; Grossh. Opred. Rast. Kavk. (1949) 513; Sofieva in Fl. Azerb. VIII, 541.

Perennial. Plants with more or less thick vertical root; root collar with fewer brownish remnants of dead leaves, subglabrous. Leaves 8–15 cm long and 16–30 mm wide, more or less pubescent from crisped hairs to subglabrous, runcinately pinnatipartite, with more or less deflexed, usually toothed lateral lobes and smaller terminal lobe. Scapes many, with lax arachnoid-hairy tomentum below capitula. Involucres 11–16 mm long; outer involucre bracts lanceolate-ovate to lanceolate, more or less deflected from inner bracts and slightly wider than them, with narrow whitish membranous margin, with fairly long subacute subterminal cornicle; inner bracts oblong-linear, almost two times as long as longest outer bracts, with well developed, fairly long subterminal cornicle. Florets yellow, with hairs in the middle part of corolla. Achenes light yellowish-brown; body about 3 mm long, with fewer longitudinal furrows, with numerous acute tubercles in the upper half; cone 0.8–1.2 mm long; beak 7.5–9.0 mm long; pappus about 6 mm long, white. Flowering April to May.

Desert steppes, stony slopes, gravel-beds, roadsides.—*Caucasus*: Eastern Transcaucasia. Endemic. Described from Mila Steppe. Type in Leningrad.

Subsection 7. Erythrosperma (Dahlst.) Schischk. comb. nova.—*Taraxacum* grex *Erythrosperma* Dahlst. in Lindm. Svensk. Fanerogamfl. ed. 2 (1926) 561.—*T. sect. Erythrocarpa* Hand.-Mazz. Monogr. Tarax. (1907) 103, p. p.—Usually medium plants of plains or lower mountains, less often alpine, with more or less thick, sometimes many-headed root, flowering usually in May–July; root collar with small quantity of brownish tomentum in axil of leaves or glabrous. Scapes more or less arachnoid

pubescent below capitula, less often glabrous; involucre bracts with small subterminal cornicle, less often without; outer bracts fewer, more or less separated or appressed to inner bracts, latter one and one-half to two and one-half times as long as longest outer bracts. Florets light yellow or yellow. Achenes reddish-brownish or reddish; body 2.5–4.5 mm long, with rather numerous acute tubercles in the upper third or half, at the apex abruptly terminated into 0.5–1.2 mm long cone; beak (4.5)6–10(11) mm long, more than one and one-half, usually two or more times as long as achene body.

Type of subsection: *T. erythrospermum* Andr.

Note. This subsection differs from subsection *Obliqua* only by the color of the achenes and is often combined with it.

110. ***T. erythrospermum*** Andr. in Bess. Enum. pl. Volhyn., Podol. etc. (1822) 75; DC. Prodr. VII, 147; Schischk. in Fl. Yugo-Vost. VI, 463; Stank. and Tal. Opred. Vyssh. Rast. (1949) 694; Schischk. in Kryl. Fl. Zap. Sib. XI. 3008; Klovov in Vizn. Rosl. URSR, 593.—*T. caucasicum* Y. *erythrospermum* (Andrz.) Ldb. Fl. Ross. II (1846) 814.—*T. laevigatum* β. *erythrospermum* (Andrz.) Schmalh. Fl. II (1897) 149.—*T. laevigatum* auct. non DC.: Hand.-Mazz. Monogr. Tarax. (1907) 109 p. p.

Perennial. Plants with slender ascending or vertical root; root collar covered with dark brown remnants of dead leaves; with not always distinct lax brownish tomentum of long flexuous hairs in their axil. Leaves glabrous or scatteredly hairy, 2–8 cm long and 5–20 mm wide, runcinately pinnatipartite with horizontal or deflexed, often toothed lateral lobes and smaller terminal lobe, less often pinnatilobate or partly even undivided, more or less toothed. Scapes usually with lax arachnoid-hairy tomentum under capitula. Involucres 8–12 mm long; outer involucre bracts lanceolate-ovate to lanceolate, more or less deflected from bracts (recurved by end of anthesis), almost as wide as latter or slightly narrower, herbaceous, with rather wide, more or less ciliate (from short flexuous hairs), scarious border, usually with short, but always distinct, subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, with rather long, often subacute subterminal cornicle. Florets light yellow, peripheral florets with wide dark stripe on lower side of ligule, scatteredly hairy in the middle part of corolla. Achenes brownish-reddish or reddish, body 2.5–3.5 mm long, with numerous acute tubercles in the upper half; cone 0.5–0.7 mm long; beak 5–8 mm long; pappus 5–6 mm long, whitish. Flowering May to July.

Alkaline meadows, alkali soils, herb slopes. —*European Part*: Baltic Region, Ladoga-Ilmen, Upper Dnieper, Volga-Kama, Middle Dnieper, Volga-Don, Trans-Volga, Bessarabia, Black Sea Region, Lower Don, Lower Volga, Crimea; *Western Siberia*: Ob' Region (southern part),

- 499 Upper Tobol, Irtysh, Altai; *Soviet Central Asia: Aralo-Caspian, Syr-Darya*. *General distribution*: central Europe. Described from western part of Ukraine. Type in Kiev, isotype in Leningrad.

Note. In the Baltic Region, this species is replaced by a whole series of very similar species, which include, in particular, species reported by Marklund (G. Marklund in *Acta bot. fennica*, XXIII (1938) 34–42) from Estonia: *T. brachycranum* (Dahlst.) Markl. (ibid. 34), *T. brachyglossum* Dahlst. (in *Bot. Notis.* (1905) 170), *T. decipiens* Raunk. (in *Bot. Tidskr.* XXV (1903) 139), *T. fulvum* Raunk. (*Dansk Exrursionsfl.* ed. 2 (1906) P.?) *T. gotlandicum* Dahlst. (op. cit. 169), *T. isthmicola* Lindb f. (in *Acta soc. fauna et flora fennica* XXIX (1908) 42), *T. laetum* Dahlst. (op. cit. 169), *T. linguatiformis* Markl. (op. cit. 83), *T. marginatum* Dahlst. (op. cit. 165), *T. proximum* Dahlst. (op. cit. 165), *T. scanicum* Dahlst. (in *Arkiv för Botanik*. X, 11 (1911) 21), and *T. tenellisquameum* Markl. (op. cit. 86).

111. **T. pineticola** Klok. in Bot.. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR XVI 367 and in Vizn. Rosl. URSR (1950) 593, diagn. in Russ.

Perennial. Plants with rather thick, often many-headed root; root collar covered with dark brown remnants of old leaves, with not always distinct lax arachnoid tomentum of long flexuous hairs in their axil. Leaves numerous, 6–16 cm long and 8–35 mm wide, glabrous or subglabrous, runcinately pinnatifid, with more or less toothed, often deflexed lateral lobes; terminal lobe smaller. Scapes one to five, 8–30 cm long, with small quantity of lax arachnoid-hairy tomentum below capitula or entirely glabrous. Involucres 10–14 mm long; outer involucral bracts light green, herbaceous, lanceolate-ovate to lanceolate, more or less deflected from inner bracts (to recurved) and almost as wide as latter, with short subterminal cornicle; inner bracts dark green, herbaceous, oblong-linear, one and one-half to two times as long as longest outer bracts, with short subterminal cornicle, often two on each bract. Florets light yellow; peripheral florets with wide dark stripe on lower side of ligule, with scattered short hairs in the middle part of corolla. Achenes reddish-brown; body 2.6–3.5 mm long, with numerous acute tubercles in the upper half, only with short obtuse tubercles below; cone 0.75–1.2 mm long; beak 7–9 mm long; pappus 5.0–6.5 mm long, white. Flowering May to July.

Pine forest sands in northern Donets basin.—*European Part*: Middle Dnieper (eastern part), Volga-Don (western part). Endemic. Described from vicinity of Zmiev. Type in Leningrad.

112. **T. tauricum** Kotov sp. nova in Addenda XXVIII, 736.

Perennial. Root collar covered with brownish remnants of dead leaves, subglabrous. Leaves short petiolate to 8 cm long and 2.5 cm wide, runcinately pinnatisect with wide deltoid, horizontal, separated or

500 somewhat reflexed lateral lobes and smaller terminal lobe, widest in the middle part. Scapes to 20 cm long. Capitula rather large, about 15 mm long and 25 mm wide; outer involucre bracts lanceolate-ovate to broadly lanceolate, more or less deflexed from inner bracts and almost as wide as latter, grayish-green, without or with short cornicles; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, with well developed subterminal cornicle. Florets yellow. Achenes brownish-reddish; body 3–4 mm long, with acute tubercles in the upper half; cone about 0.75 mm long; beak 9.0–10.5 mm long; pappus 7.5–8.0 mm long, white. Flowering April to May. (Plate XXVI, Fig. 1).

Stony slopes.—*European Part*: Crimea (Karadag). Endemic. described from Karadag. Type (Crimea, Karadag), Svyataya Gora, 24.V.1941, M. Kotov) in Kiev.

Note. The diagnosis was kindly sent to me for publication by M.N. Kotov. According to the author of the species, it differs from *T. erythrospermum* Andr. by larger capitula and a longer pappus, and grows on dry stony slopes, while *T. erythrospermum* is mesophytic, growing in more wet places, in steppes and alkaline meadows.

113. **T. intercedens** Markl. in Acta Bot. Fenn. XXIII (1938) 80.—**lc.**: Markl. *ibid.* fig. 1. —**Exs.**: Eston. pl. No. 183.

Perennial. Plants 5–15 cm high, with rather thick, vertical root; root collar covered with numerous dark brown remnants of dead leaves, with more or less profuse tomentum in their axil. Leaves 4–12 cm long and 4–16 mm wide, glabrous or subglabrous, pinnatipartite with rather numerous, acuminate, often deflexed lateral lobes, smaller intermediate lobules or teeth and narrow smaller. terminal lobe. Scapes more or less ascending, weakly arachnoid pubescent below capitula. Involucres 10–17 mm long; outer involucre bracts ovate to ovate-lanceolate, more or less appressed to inner bracts, almost as wide or slightly wider than them, herbaceous, with more or less pinkish margin, without cornicles; inner bracts usually two times as long as longest outer bracts, oblong-linear, herbaceous, more or less reddish in the upper part with or without short indistinct, subterminal cornicle. Florets light yellow, peripheral florets with wide dark stripe on the lower side of ligules. Achenes reddish-brown; body 2.5–3.5 mm long, with few longitudinal furrows, with acute tubercles in the upper half, subglabrous below; cone about 1 mm long; beak 9–12 mm long, pappus 7 mm long, white, often with brownish tinge. Flowering May to June.

501 Alkaline, usually coastal meadows.—*European Part*: Baltic Region. Endemic. Described from Estonia. Type in Tartu.

114. **T. praticola** Schischk. in Grossh. Fl. Kavk. IV (1934) 245;

Grossh. Opred. Rast. Kavk. (1949) 512; Kapeller in Fl. Gruzii, VIII, 663; Sofieva in Fl. Azerb. VIII, 541.—*T. laevigatum* auct. fl. caucas. non DC.

Perennial. Plants 4–15 cm high, with rather thick root; root collar glabrous. Leaves 6–20 cm long and 12–40 mm wide, more or less scatteredly hairy to subglabrous, green, runcinately pinnatipartite, with more or less deflexed lateral lobes, usually having more or less toothed anterior margin, four to seven on each side, and smaller terminal lobe. Scapes more or less ascending, weakly arachnoid pubescent below capitula. Involucres 9–14 mm long at flowering time, slightly glaucous-green; outer involucral bracts ovate-lanceolate to lanceolate, more or less deflected from inner bracts (to recurved) and almost as wide as latter, with wide scarious border, with rather long dark subterminal cornicle or partly without; inner bracts oblong-linear, usually two times as long as longest outer bracts, with rather long, often subcute, subterminal cornicles or partly without them. Florets yellow or light yellow; peripheral florets with wider dark stripe on the lower side of ligule. Achenes reddish-brown; body 2.7–3.5 mm long, with rather numerous but shallow, longitudinal furrows, with acute tubercles in the upper third, only with short obtuse tubercles below (often almost to the base); cone 0.9–1.2 mm long; beak 7–9 mm long; pappus about 6 mm long, whitish, sometimes with brownish tinge. Flowering April to May.

Meadows, herb slopes, alkaline soils, roadsides.—*Caucasus*: Eastern and Southern Transcaucasia. Endemic. Described from Azerbaidzhan SSR. Lectotype (Azerbaidzhan, Karabakh steppe, near Agdam, 2.V.1928, L. Prilipko) in Leningrad.

115. ***T. armeniacum*** Schischk. in Grossh. Fl. Kavk. IV (1934) 246; Grossh. Opred. Rast. Kavk. (1949) 512.

Perennial. Plants with rather thick vertical root; root collar covered with dark brown remnants of dead leaves. Leaves 10–18 cm long and 1–2 cm wide, light glaucous-green, runcinately pinnatipartite, with entire or more or less toothed, usually deflexed, long-acuminate lobes, weakly pubescent on midrib, glabrous or subglabrous in other parts. Scapes slightly longer than leaves, 10–25 cm long, with more or less developed, rather lax arachnoid-hairy tomentum mostly in the upper part. Involucres 10–12 mm long; outer involucral bracts lanceolate-ovate to broadly lanceolate, recurved, slightly wider than inner, light green, almost membranous, usually with well developed but obtuse subterminal cornicle; inner bracts, one and one-half to two times as long as longest outer bracts, oblong-linear, herbaceous, green, with well developed, obtuse, subterminal cornicle. Florets yellow, corolla of peripheral florets with wide dark stripe on outer side, [corolla] tube sparsely hairy. Achenes reddish-brown; body 2.5–3.0 mm long, with shorter and occasional acute tubercles in the upper

half; cone 0.8–1.0 mm long; beak 4.5–6.0 mm long; pappus 5–6 mm long, white. Flowering June to July.

Forest meadows in middle mountain zone.—*Caucasus*: Southern Transcaucasia (western part). *General distribution*: Armenia and Kurdistan. Described from Armenia. Type and isotype in Leningrad.

116. **T. androssovii** Schischk. in Fl. Turkm. VII (1960) 384.

Perennial. Plants with vertical or ascending root; root collar covered with remnants of dead leaves. Leaves rather numerous, 6–15 cm long and 1.5–2.5 cm wide, glabrous, somewhat glaucous, runcinately pinnatipartite or pinnatisect, with acute, usually deflexed, entire or more or less toothed lobes. Scapes more or less as long as leaves, solitary or few, covered with lax arachnoid hairy tomentum below capitula, scatteredly hairy or glabrous in remaining part. Involucre 13–16 mm long; outer involucre bracts broadly ovate to ovate-lanceolate, deflected in the upper part and usually with short darker subterminal cornicle, herbaceous, with narrow scarious border, usually slightly appressed to inner bracts and wider than them; inner bracts two times as long as longest outer bracts, oblong-linear, without or with indistinct subterminal cornicle. Florets yellowish-white, peripheral florets with dark stripe on the lower side; tube scatteredly short hairy only in the upper part. Achenes reddish brown; body 3.0–3.5 mm long, with numerous acute tubercles almost from the base; cone 0.8–1.3 mm long; beak slender, 8–10 mm long; pappus 6–7 mm long, white. Flowering April to May.

Stony slopes, gravel-beds.—*Soviet Central Asia*: mountainous Turkmenia. Endemic. Described from vicinity of Ashkhabad. Type and isotype in Leningrad.

117. **T. repandum** Pavl. in Vestn. Akad. Nauk Kazakh. SSR, 9 (1950) 30; Kovalevaskaya in Fl. Uzb. VI (1962) 461.—*Ic.*: Pavlov, op. cit. Fig. 21.

Perennial. Plant 10–30 cm high, with rather thick root; root collar covered with brownish remnants of dead leaves, with profuse brownish tomentum in their axil. Leaves 6–20 cm long and 13–45 mm wide, subglabrous, with rather long winged petioles, lyrate pinnatipartite, with
503 more or less deflexed, subacute entire, lateral lobes, two to five on each side, and larger terminal lobe, usually with few intermediate lobules. Scapes with very weak arachnoid pubescence below capitula, often subglabrous. Involucres 10–14 mm long, glaucous-green; outer involucre bracts ovate-lanceolate to lanceolate, more or less appressed to inner bracts at anthesis and almost as wide as inner bracts, more or less reddish near the apex with small subterminal cornicle or partly without; inner bracts oblong-linear, usually two and one-half times as long as longest outer

bracts, with subterminal cornicle or partly without latter. Florets yellow, peripheral florets with dark stripes on the lower side of ligules. Achenes reddish-brown; body 3.5–4.0 mm long, with few longitudinal furrows, with shorter acute tubercles in the upper third; one 0.5–0.8 mm long, distinctly separated from beak; beak 5–6 mm long; pappus 6–7 mm long, whitish. Flowering June to July.

Stony and rubbly slopes, rocks in upper mountain zone.—*Soviet Central Asia*: Tien Shan (western part). Endemic. Described from western Tien Shan (Pskemsk Range). Type in Alma-Ata; isotype in Moscow.

118. **T. tianshanicum** Pavl. in Vestn. Akad. Nauk Kazakh. SSR, 8 (1950) 30; Kovalevskaya in Fl. Uzb. VI, 460.—**lc.**: Pavlov, op. cit. Fig. 20.

Perennial. Plant with slender vertical root. Leaves with longer narrow-winged petioles, green, pinnatilobate or pinnatipartite, awned-toothed, with rather wide lateral segments or lobes, three to six on each side and small usually also toothed, terminal lobe, more or less toothed between lobes. Scapes three or four, with weak arachnoid pubescence below capitula. Involucres 10–14 mm long, glaucous-green; outer involucral bracts broadly lanceolate to lanceolate, more or less deflected from inner bracts recurved in fruits, purple at the apex, without cornicles; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, usually with small, dark, subterminal cornicle. Florets yellow; peripheral florets with reddish-brown stripes on the lower side of ligule. Achene reddish-brown; body 2.5–3.0 mm long, with rather numerous longitudinal furrows, with acute tubercles in the upper half, and short obtuse tubercles below; cone 0.8–1.0 mm long; beak 7–9 mm long; pappus 4–5 mm long, white. Flowering June to July.

Rubbly and stony slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Tien Shan (Pskemsk Range). Endemic. Described from Pskemsk Range. Type in Alma-Ata; isotype in Moscow.

119. **T. sumneviczii** Schischk. in Sistem. Zam. Gerb. Tomsk. Univ. 1–2 (1949) 8 and in Kryl. Fl. Zap. Sib. XI (1949) 3008.

504 Perennial. Plant 1–7 cm high, with thick, many-headed root; root collar covered with numerous dark brown remnants of dead leaves, with small quantity of long flexuous hairs in their axil or subglabrous, glaucous-green, deeply pinnatipartite, with deflexed, entire or subentire, fairly narrow, 5–10 lateral lobes on each side, and small terminal lobe, sometimes with small intermediate lobules between lobes. Scapes with profuse arachnoid-hairy tomentum below capitula. Involucres 8–12 mm long; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts, almost as wide as inner bracts or slightly wider,

membranous, light green, with wide scarious border, more or less hairy along margin, without cornicles; inner bracts oblong-linear, two times as long as longest outer bracts, green, often slightly glaucous, dark at apex, without cornicles or with indistinct cornicles. Florets light green(?), with subglabrous or glabrous corolla, peripheral florets with wide dark stripe on the lower side of ligule. Achenes reddish-brown; body about 3.5 mm long, with fewer longitudinal furrows; with shorter, obtuse or subobtuse, tubercles below; cone about 1 mm long; beak 4.0–6.5 mm long; pappus about 5 mm long, whitish. Flowering July to August.

Alkaline meadows, alkali soils, clayey slopes in middle and upper mountain zones.—*Western Siberia*: Altai; *Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan. Endemic. Described from Chuya River Valley. Type (near the mouth of the Kiyak-Nar River, 31.VIII.1918, G. Sumnevich) in Leningrad; isotype in Tomsk.

120. **T. rubignans** Dahlst. apud Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 227.—**!c.**: Dahlst. *ibid.* fig. 17.

Perennial. Plant 6–18 cm high, with rather thick root; root collar glabrous. Leaves 3–10 cm long and 1–2 cm wide, light green, glabrous, gradually narrowed toward base in rather long, winged petiole, runcinately pinnatipartite or pinnatilobate, with more or less deflexed, entire or more or less toothed lateral segments and lobes, three to five on each side, and larger terminal lobe. Scapes entirely glabrous. Involucre 12–15 mm long, dark green; outer involucral bracts broadly lanceolate to lanceolate-ovate, more or less appressed to inner bracts and slightly wider than them or almost as wide, with very narrow scarious border, without cornicles; inner bracts oblong linear, two to two and one-half times as long as longest outer bracts, dark in the upper part without cornicles. Florets yellow, peripheral florets with more or less developed dark stripe on the lower side of ligule. Achenes reddish-brown; body 4.0–4.5 mm long, with few longitudinal furrows, covered with acute tubercles in the upper half, with
505 only short obtuse tubercles below; cone wide conical, 0.7–1.0 mm long; beak 8–10 mm long; pappus 6–7 mm long, white. Flowering July to August.

Meadows and gravel-beds.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (Anauka River). Type in Stockholm; isotype in Leningrad.

121. **T. rufum** Dahlst. apud Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 228.—**!c.**: Dahlst. *ibid.* fig. 18.

Perennial. Plant 6–25 cm high, with rather thick, sometimes many-headed root; root collar glabrous. Leaves 4–10 mm long and 6–23 mm wide, glabrous, with rather long, winged petioles, runcinately pinnatipartite

or pinnatilobate, with more or less deflexed, entire or more or less toothed lateral lobes, four to six on each side, and small terminal lobe. Scapes with weak arachnoid pubescence below capitula. Involucres 12–15 mm long, dark green; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner involucral bracts at anthesis, and almost as wide as inner bracts, with scarious border, subapically with short obtuse (at least in some bracts) subterminal cornicles; inner bracts oblong-linear, about two times as long as longest outer bracts, often also with small subterminal cornicles. Florets yellow or light yellow(?). Achenes reddish-brown; body 4.10–4.5 mm long, with few longitudinal furrows, with more acute tubercles in the upper half, only with short obtuse tubercles below; cone 0.8–1.2 mm long; beak 8–9 mm long; pappus 6–7 mm long, white partly with weak brownish tinge. Flowering July to August.

Meadows and stony slopes.—*Far East*: Kamchatka, Sakhalin. Endemic. Described from Kamchatka (Koryats volcano). Type in Stockholm; isotype in Leningrad.

122. **T. lateritium** Dahlst. in Arkiv för Botanik. V, 9 (1906) 32.—**lc.**: Dahlst. *ibid.* t. 18.

Perennial. Plants with slender root. Leaves 8–15 cm long and 8–24 mm wide, with rather long, winged petiole, glabrous or subglabrous, shallow pinnatipartite or pinnatilobate, with rather wide lateral lobes, deflexed, often toothed on the upper margin, between lobes with occasional large teeth; terminal lobe rather large; outer leaves in rosette often undivided, sinuate-toothed. Scapes one to three, only with few flexuous hairs below capitula. Involucres 13–15 mm long, dark green; outer involucral bracts ovate to broadly lanceolate, more or less appressed to inner bracts and slightly wider than them, almost without scarious border, often more or less pinkish in upper part with short (in the more inner of the outer bracts sometimes up to 1.5 mm long), dark colored subterminal cornicle or (in some larger bracts) without cornicles; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, with short, not always distinct, subterminal cornicle. Florets yellow; peripheral florets with narrow, dark, stripe on the lower side of ligule. Achenes light reddish-brown (“brick-red”); body 3.5–4.0 mm long, with numerous actue tubercles in the upper half; cone about 1.2 mm long; beak 6–8 mm long; pappus 6–7 mm long, white. Flowering VII–VIII.

Meadows, herb slopes, gravel-beds.—*Arctic*: Arctic Siberia, Chukotka, Anadyr; *Eastern Siberia*: Yenisei (northern part), Lena-Kolyma (northern part). Endemic. Described from Chukotka Peninsula. Type in Stockholm.

Subsection 8. Mongolica (Dahlst.) Kitam. in Mem. Coll. Univ. Kyoto, Ser. B, XXIV, 1 (1957) 18, p. p.—*Taraxacum grex Mongolica* Dahlst. in

Acta Horti Gothoburg, II (1926) 159.— Smaller, less often, medium plants of alpine or middle mountains, less often lower mountains, with more or less thick root, flowering usually in June–August; root collar glabrous or with small quantity of brownish tomentum in axil of leaves. Scapes with lax arachnoid-hairy tomentum below capitula, less often glabrous. Involucral bracts often with small cornicle, less often without cornicle; outer bracts fewer, more or less appressed to inner bracts; inner bracts one and one-half to two times as long as longest outer bracts. Florets light yellow or yellow. Achenes light brown; body 2.5–4.5 mm long, often with rather numerous, acute tubercles in the upper part, apically rather abruptly terminated in 0.4–1.0 mm long cone; beak 4.5–10.0 mm long, always more than one and one-half times as long as the body of achenes.

Type of subsection: *T. mongolica* Dahlst.

Note. Species of this subsection seem to occupy an intermediate position between section *Taraxacum* and other, predominantly alpine, sections of the genus with shorter achene beaks.

123. ***T. mongolicum*** Hand.-Mazz. *Monogr. Tarax.* (1907) 67 p. p; Dahlst. in *Acta Horti Gothoburg*. II (1926) 159, descr. emend.; Kom. and Alis. *Opred. Rast. Dalnevost. Kr.* II, 1092; Karavaev, *Konsp. Fl. Yakut.* 177.—**lc.**: Hand.-Mazz. op. cit. t. 2, fig. 13; Dahlst. op. cit. fig. 7 and t. 2, fig. 12–17; Kom. and Alis. op. cit. Plate 328; Kitam. in *Mem. Coll. Sc. Univ. Kyoto*, ser. B, XXIV, 1 (1957) fig. 6.2 and fig. 11.2.

507 Perennial. Plant with rather thick root. Leaves 5–15 cm long and 1–4 cm wide, light green, with sparse arachnoid pubescence (often subglabrous), usually pinnatipartite, with lateral lobes having more or less toothed upper margin, and often larger terminal lobe, less often pinnatilobate or partly even undivided, sinuate-toothed. Scapes as long as leaves or slightly longer with profuse lax arachnoid-hairy tomentum below capitula. Involucres 12–14 mm long, light green; outer involucral bracts ovate-lanceolate to lanceolate, more or less appressed to inner bracts and almost as wide as the latter, with distinct reticulate venation in dry state, with rather wide whitish (sometimes pinkish) border, often more or less covered with rather lax arachnoid tomentum, without or with small dark pink subterminal cornicle; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, with short, dark pink, but not always well developed, subterminal cornicles. Florets light yellow; peripheral florets with pinkish-violet stripes on the lower side of ligule. Achenes light brown; body about 4 mm long, with few longitudinal furrows, covered with acute tubercles in the upper half, with shorter obtuse tubercles below almost to the base; cone about 1 mm long; beak 7–10 mm long; pappus about 6 mm long, whitish. Flowering May to July.

Meadows, herb slopes, near roads, gravel-beds, in inhabited areas, usually in lower and middle mountain zones.—*Eastern Siberia*: Dauria, Lena-Kolyma (southern part); *Far East*: Zeya-Bureya, Ussuri. *General distribution*: Mongolia, China. Described from China. Type in Vienna.

Note. The narrow distribution of this species in the territory of the USSR is still unexplained. Possibly, it also extends into eastern Kazakhstan.

124. **T. ikonnikovii** Schisch. sp. nova in Addenda XXVIII, 736.

Perennial. Plant 8–25 cm high, with thick, usually many-headed root; collar covered with numerous dark brown remnants of dead leaves, with brownish tomentum of long flexuous hairs in their axil. Leaves 8–15 cm long and 8–25 mm wide, more or less covered with scattered hairs to entirely glabrous, from pinnatipartite with relatively distant, usually entire lobes to undivided, more or less toothed on margin or even entire, on rather long narrow-winged petioles. Scapes mostly arachnoid pubescent, with very lax arachnoid-tomentum only below capitula at flowering time and later. Involucres 10–14 mm long, light green; outer involucral bracts broadly ovate to lanceolate-ovate, appressed to inner involucral bracts and much wider than them, membranous, whitish on margin and more or less toothed, with short, but always distinctly developed subterminal cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, herbaceous, more or less reddish in the upper part, with indistinct short cornicle or entirely without them. Florets light yellow, peripheral florets with wide dark stripes on the outer side of ligules, short hairy in the middle part of corolla. Achenes light brown; body 3.0–3.5 mm long, with rather numerous narrow ribs, covered with numerous acute tubercles almost from the base; cone 0.7–1.0 mm long, well separated from beak; beak 6–8 mm long; pappus about 6 mm long, whitish. Flowering June to July.

508 Meadows, stony slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (eastern part). Endemic. Described from Pamir. Type (mountainous Badakhshan Autonomous Region, valley of western Pshart River, below mouth of tributary of Dzhan-Kaında, 5.VII.1958, No. 440, N. Tzvelev) in Leningrad.

125. **T. badachschanicum** Schischk. sp. nova in Addenda XXVIII, 737.

Perennial. Plant with rather thick root; root collar covered with brownish remnants of dead leaves. Leaves 4–12 mm long and 1–3 cm wide, runcinately pinnatipartite or pinnatilobate, usually with intermediate teeth or lobes, acute or subacute, glabrous; lateral segments or lobes

somewhat deflexed, often with occasional teeth. Scapes almost as long as leaves, with lax arachnoid-hairy tomentum only in the upper part below capitula, sometimes subglabrous. Involucres 12–15 mm long, light green; outer involucre bracts broadly ovate to lanceolate-ovate, appressed to inner bracts and much wider than them, membranous, usually (not in all involucre bracts of capitulum) with distinctly developed but short subterminal cornicle; inner bracts two to two one-half times as long as longest outer bracts, oblong-linear, herbaceous, with well-developed subterminal cornicle. Florets light yellow, peripheral florets with wide dark stripe on the lower side of ligules, with rather numerous but short hairs in the middle part of corolla. Achenes light brown; body 3.5–4.0 mm long, with shorter acute tubercles in the upper third, below only with short spinules on ribs; cone 0.6–0.8 mm long; beak 6–7 mm long; pappus 7–9 mm long, white. Flowering June to July.

Stony slopes, dry gravel-beds above 3,000 m.—*Soviet Central Asia*: Pamiro-Alai (eastern part). Endemic. Described from Pamir. Type (mountainous Badakhshan Autonomous Region, basin of western Pshart River, Pshart Valley in its lower reaches, 14.VI.1958, No. 114, N. Tzvelev) in Leningrad.

126. **T. stanjukoviczii** Schischk. sp. nova in Addenda XXVIII, 737.

509 Perennial. Plant 6–25 cm high; with rather thick, often many-headed root; root collar glabrous. Leaves 7–15 cm long and 2.0–3.5 cm wide, green, undivided, large toothed to pinnatifid, with rather wide entire or subentire lateral lobes, and larger terminal lobe. Scapes with weak arachnoid pubescence below capitula, often subglabrous. Involucres 12–18 mm long; outer involucre bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts and slightly wider than them, dark green, with very narrow scarious border, with small obtuse or subobtuse, usually dark colored subterminal cornicle; inner oblong-linear, one and one-half to two times as long as longest outer bracts, with small dark subterminal cornicles or partly without them. Florets yellow, with subglabrous corolla, peripheral florets with wide dark stripe on the lower side of ligules. Achenes light yellowish-brown; body 3.5–4.0 mm long, with rather numerous longitudinal furrows, with acute tubercles in the upper half, only with short obtuse tubercles below; cone 0.8–1.2 mm long; beak 7–10 mm long; pappus 7–8 mm long, white. Flowering July to August.

Grassy patches and gravel-beds in upper mountain zone—*Soviet Central Asia*: Pamiro-Alai. Endemic. Described from Pamir. Type (mountainous Badakhshan Autonomous Region, northwestern Pamir, left bank of Takhta-Korum River, 2 km upstream from its mouth, 29.VII.1958, No. 919, N. Tzvelev) and isotype in Leningrad.

127. **T. modestum** Schischk. sp. nova in Addenda XXVIII, 738.—Kovalevskaya in Fl. Uzb. VI (1962) 4 61, diagn in Russ.—*T. alpinum* auct. non Hegetschw. and Heer: Hand.-Mazz. Monogr. Tarax. (1907) 94, p. p.

Perennial. Plants 4–12 cm high, with rather thick, often many-headed root; root collar glabrous or weakly pubescent. Leaves 4–12 cm long and 5–20 mm wide, more or less scatteredly hairy, subglabrous, runcinately pinnatipartite, with horizontal or more or less deflexed, usually entire lateral lobes, and small terminal lobe, often with intermediate lobules between lateral lobes, Scapes more or less lax arachnoid hairy tomentose below capitula. Involucre 8–13 mm long, green; outer involucral bracts broadly lanceolate to lanceolate, more or less appressed to inner bracts and almost as wide as inner bracts (but partly narrower), with very narrow scarious border and a few flexuous hairs, without or with indistinct dark cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, dark in the upper part, without or with small indistinct cornicle. Florets yellow or light yellow(?), with fewer hairs in the middle part of corolla, peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body about 3.5 mm long, with fewer longitudinal furrows, more or less covered with shorter, acute tubercles in the upper third, partly coalescing with scale-like tubercles; cone 0.7–1.0 long; gradually terminated in 5–6 mm long beak; pappus 4–5 mm long, white. Flowering July.

Meadow-steppe slopes of middle and upper mountain zone.—*Soviet Central Asia*: Tien Shan (western part). Endemic. Described from western Tien Shan. Type (Chimgan Mountain, 1904, collector unknown) and isotype in Leningrad.

128. **T. saposhnikovii** Schischk. sp. nova in Addenda XXVIII, 739.

510 Perennial. Plants 3–8 cm high, with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves, glabrous. Leaves 4–8 cm long and 8–17 mm wide, glabrous, narrowed at base to short petiole, weakly glaucescent, runcinately pinnatipartite with more or less deflexed, wide, often subobtusely, lateral lobes, two to five on each side, and larger terminal lobe. Scapes with lax arachnoid-hairy tomentum below capitula. Involucre 9–14 mm long; outer involucral bracts broadly lanceolate to lanceolate-ovate, more or less appressed to inner bracts and slightly wider than them, membranous, with distinct reticulate venation, without or with small dark cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, dark at the apex, partly without and partly with small cornicle. Florets whitish or light yellow(?), peripheral florets with wide pinkish stripe on the lower side of ligule; with pinkish-lilac tinge in dry state.

Corolla subglabrous. Achenes light brown; body 3.5–4.0 mm long, with fewer longitudinal furrows, covered with acute tubercles in the upper half, only with short obtuse tubercles below; cone about 0.6 mm long; beak of immature achenes 4–5 mm long; pappus about 5 mm long, white. flowering June to July.

Stony and rubbly slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia: Dzhungaria-Tarbagatai. General distribution:* probably found in regions bordering China. Described from Saur Range. Type (Saur Range, Sary-Choku road along mountain ridge, on left bank of Terekta River, 2.VI.1914, B. Schischkin) in Leningrad.

129. **T. atrans** Schischk. sp. nova in Addenda XXVIII, 739.

Perennial. Plants with slender, vertical or ascending root; root collar covered with brownish remnants of dead leaves. Leaves 2–8 cm. long, and 3–12 mm wide, undivided, gradually narrowed at base, obtuse or subacute, sinuate-toothed, less often entire or shallow lobed. Scapes solitary or few, almost as long as leaves, with profuse arachnoid-hairy tomentum below capitula. Involucre 8–10 mm long; involucre bracts herbaceous, green, with narrow scarious border, with short obtuse cornicles (not in all bracts of capitulum) at apex; outer bracts broadly ovate to lanceolate-ovate, appressed to inner bracts and much wider than them; inner bracts usually two times as long as longest outer, oblong-linear. Florets light yellow; ligule of peripheral florets with wide dark stripe on the lower side, [corolla] tube glabrous. Achenes light yellowish-brown; body 2.5–
 511 3.0 mm long, covered with rather numerous acute tubercles in the upper half; cone about 0.5–0.8 mm long, indistinctly terminating in beak; beak 5.5–6.5 mm long; pappus about 6 mm long, white. Flowering July to August.

Rubbly and stony slopes, gravel-beds in alpine zone.—*Soviet Central Asia: Tien Shan (eastern part). General distribution:* probably found in regions bordering China. Described from Dzhungoltau Range. Type (spurs of Dzhungoltau Mountain, rubbly slope of saddle of Karakol Pass, 2.VII.1916, No. 2075, M. Sovetkina and S. Chausova) and isotype in Leningrad.

130. **T. vassilczenkoi** Schischk. sp. nova in Addenda XXVIII, 739.

Perennial. Plants 2.5–8.0 cm high, with rather thick, often many-headed root; root collar covered with brownish remnants of dead leaves, glabrous or subglabrous, green, gradually narrowed at base with rather long, narrow-winged petiole, from undivided, sinuate-toothed to pinnatipartite, with a few entire or subentire lateral lobes and larger terminal lobe. Scapes scatteredly arachnoid-hairy, with rather profuse arachnoid-hairy tomentum below capitula. Involucre 9–13 mm long,

green; involucre bracts more or less pinkish-violet in the upper part, without cornicles or some with indistinct cornicles; outer broadly lanceolate to lanceolate, more or less appressed to inner bracts, almost as wide as inner bracts or slightly wider, with very narrow scarious border, more or less hairy along margin in the upper part; inner bracts oblong-ovate, one and one-half to two times as long as longest outer bracts. Florets yellow, with glabrous or subglabrous corolla; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body 2.5–3.0 mm long with a few longitudinal furrows, covered with acute tubercles in the upper third; cone 0.4–0.6 mm long; beak 6–8 mm long; pappus 5–6 mm long, white, flowering July to August.

Herb slopes, grassy patches in middle and upper mountain zones.—*Soviet Central Asia*: Pamiro-Alai (western part). Endemic. Described from the Hissar Range. Type (Hissar Range, basin of Tupalang River, Bagoli-Shamol natural boundary near Zordolyu-Pas Mountain, 1.VIII.1960, No. 71, I. Vassilczenko and L. Vassileva) in Leningrad.

131. **T. kirghizicum** Schischk. sp. nova in Addenda, XXVIII, 740.

Perennial. Plants with rather thick vertical root; root collar covered with dark brown remnants of dead leaves, glabrous. Leaves numerous, 2–6 cm long and 0.5–1.0 cm wide, undivided, more or less sinuate-toothed. Scapes with weak arachnoid pubescence below capitula. Involucres about 10 mm long; outer involucre bracts ovate to lanceolate-ovate, more or less appressed to inner bracts, reflexed in fruit, much wider than inner
512 bracts, membranous, in the upper part more or less pinkish along margin, without cornicle; inner bracts oblong-linear, dark green, with or entirely without indistinct subterminal cornicle. Florets light yellow(?); peripheral florets with wide dark stripe on the lower side of ligule. Achenes light yellowish-brown; body about 3 mm long, with fewer acute tubercles in the upper part, gradually and indistinctly terminating in a short cone; beak about 7–8 mm long; pappus white, about 5 mm long. Flowering July.

Stony slopes, in mountain steppes.—*Soviet Central Asia*: Pamiro-Alai (Alai Range). Endemic. Described from Alai Range. Type (Alai Range, Sary-Tash, 22.VII.1930, No. 861, S. Juzepczuk) in Leningrad.

132. **T. songoricum** Schischk. sp. nova in Addenda, XXVIII, 740.

Perennial. Plants with thicker vertical root; root collar covered with dark brown remnants of dead leaves. Leaves rather numerous, 4–12 mm [sic., recte cm] long and 1–2.5 cm wide, glabrous or weakly arachnoid pubescent, usually pinnatilobate with many deflexed, acute, entire lobes, less often undivided and subentire; terminal lobe rather large. Scapes almost as long as leaves, solitary or few, covered with rather profuse arachnoid-hairy tomentum below capitula. Involucres 12–17 mm long;

outer involucre bracts appressed to inner and slightly wider than them, oblong-ovate to oblong-lanceolate, green but often with pinkish tinge, without cornicle; inner bracts two times as long as longest outer bracts, oblong-linear, green, with very narrow scarious border and dark tip, without cornicle. Florets light green; peripherals with wide dark (lilac) stripe on the lower side of ligule. Achenes light yellowish-brown, ribbed; about 2.5–3.0 mm long, with fewer acute tubercles only in the upper third; cone 0.4–0.5 mm long; beak slender, 4.5–6.0 mm long; pappus about 5 mm long, white. Flowering July to August.

Stony and rubbly slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Dzhungaria-Tarbagatai (Dzhungarian Alatau), *General distribution*: probably found in regions bordering China. Described from Dzhungarian Alatau. Type (Dzhungarian Alatau, basin of Koksus River, glacial source of Korzhum River, 24.VIII.1948, V. Goloskokov) and isotype in Leningrad.

133. **T. compactum** Schischk. in Sistem. Zam. Gerb. Tomsk. Univ. 1–2 (1949) 5 and in Kryl. Fl. Zap. Sib. XI (1949) 3001.

Perennial. Plants with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves, with scattered long flexuous hairs between bases of petioles. Leaves grayish-green, scatteredly hairy with semiappressed flexuous hairs, 2–7 cm long and 1.0–2.5 cm wide, irregularly sinuate-toothed with rather large, usually acuminate and 513 more or less deflexed teeth. Scapes solitary or few, almost as long as leaves, with rather profuse arachnoid-hairy tomentum below capitula. Involucres 9–12 mm long, green; outer involucre bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts and almost as wide as latter, almost without scarious border, more or less pinkish in the upper part, without cornicle; inner bracts oblong-linear, usually one and one-half to two times as long as longest outer bracts (at least some of them sometimes strongly elongated and appear only slightly shorter than inner bracts), without or with indistinct subterminal cornicle. Florets yellowish, one and one-half times as long as involucre; upper part of corolla tube and lower part of limb with scattered, rather long hairs. Achenes light brown; body 2.5–3.0 mm long, with fewer longitudinal furrows, with rather numerous acute tubercles in upper half; cone 0.4–0.6 mm long; well separated from beak; beak 4.5–6.5 mm long; pappus 5–6 mm long, white. Flowering July.

Dry meadows, herb slopes along berms of roads.—*Western Siberia*: Altai. Endemic. Described from Ust-Koksa River. Type in Tomsk; isotypes in Leningrad.

134. **T. altaicum** Schischk. in Sistem. Zam. Gerb. Tmsk. Univ. 1–2

(1949) 6 and in Kryl. Fl. Zap. Sib. XI (1949) 3004.—*T. stevenii* β . *sinuatum* DC. Prodr. VII (1938) 149, p. p.—*T. alpinum* auct. non Hegetschw. and Heer: Hand.-Mazz. Monogr. Tarax. (1907) 94, p. p.—*T. lyratum* auct. fl. sib. occid. p. p. non DC.

Perennial. Plants 5–30 cm high, with rather thick vertical root; root collar covered with dark brown remnants of dead leaves, glabrous or somewhat lanate. Leaves obovate-lanceolate, 6–25 cm long and 1.5–4.5 cm wide, green, glabrous, usually undivided, more or less toothed to subentire, less often shallow-lobed. Scapes solitary or two to five; often with more or less developed pinkish-violet tinge, covered with lax arachnoid-hairy tomentum only below capitula. Involucres 12–18 mm long; involucral bracts with well developed blackish subterminal cornicle; outer bracts slightly wider than inner and appressed to them, less often somewhat separated, ovate to ovate-lanceolate; inner bracts oblong-linear with narrow scarious border, almost two times as long as longest outer bracts and usually darker. Florets light yellow. Achenes light brownish-yellow; body 3.5–4.5 mm long, with rather numerous acute tubercles in the upper third; cone 0.5–0.8 mm long; beak 8.5–10.0 mm long; pappus about 7 mm long, white. Flowering July to August.

Rubbly and stony slopes, gravel-beds in alpine zone.—*Western Siberia*: Altai. Endemic. Described from Altai. Type in Leningrad.

135. ***T. pingue*** Schischk. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII (1937) 3.—**lc.**: Schischk. *ibid.* Fig. 1.

514 Perennial. Plants with rather thick (4–8 mm in the upper part) vertical root; root collar covered with dark brown remnants of dead leaves, somewhat woolly. Leaves numerous, 4–8 cm long and 1.0–2.5 cm wide, acute or subacute, usually undivided, irregularly sinuate-toothed, sometimes subentire, slightly (mostly long midrib) arachnoid pubescent. Scapes solitary or a few, 2–6 cm long, with lax arachnoid hairy tomentum below capitula. Involucres 15–20 mm long; involucral bracts often dark green, herbaceous, with very narrow scarious border, with long subterminal cornicle; outer bracts lanceolate-ovate to lanceolate-oblong, closely appressed to inner bracts and slightly wider than them; inner almost two times as long as longest outer bracts, oblong-linear. Florets whitish; peripheral florets with wide dark (usually lilac) stripe on the lower side of ligule; corolla subglabrous. Achenes yellowish-brown; body 4 mm long, covered with acute tubercles in the upper third; cone 0.6–0.8 mm long; beak 7–8 mm long; pappus 7–8 mm long, white. Flowering July to August.

Stony slopes, grassy patches, old moraines in alpine zone.—*Soviet Central Asia*: Dzhungaria-Tarbagatai. *General distribution*: possibly found in regions bordering China. Described from Saur Range (Taz Pass). Type in Leningrad.

136. **T. schungnanicum** Schischk. sp. nova in Addenda, XXVIII, 74.

Perennial. Plants 6–20 cm high, with rather thick root; root collar covered with blackish-brown remnant of dead leaves, glabrous. Leaves 3–10 cm long and 5–12 cm [sic; recte mm] wide, glabrous, narrowed at the base with short, wide-winged petiole, undivided, short sinuate-toothed. Scapes with weak arachnoid pubescence below capitula. Involucres 8–10 mm long; outer involucral bracts broadly ovate to lanceolate-ovate, more or less appressed to inner bracts and slightly wider than them, almost entirely membranous, greenish-white, with distinct venation, with fairly large but short and obtuse, subterminal cornicle; inner bracts oblong-linear, usually about two times as long as longest outer bracts, darkened at the apex, with small subterminal cornicle. Florets yellow, corolla short hairy in the middle part. Achenes light brown; body about 2.5 mm long, with fewer longitudinal furrows, covered with acute tubercles in the upper half; cone about 0.4 mm long; beak 4.5–5.5 mm long; pappus 5–6 mm long, whitish. Flowering July to August.

Grassy patches, stony slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (eastern part). Endemic. Described from western Pamir (Shugnan). Type (Shugnan, Dzhausan-Kus natural boundary in Shakhdara River valley, 24.VII.1897, No. 1684, S. Korshinsky) in Leningrad.

515 137. **T. magnum** V. Korol. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VIII, 6 (1940) 93.— *Ic.*: Koroleva, *ibid*, Fig. 3.

Perennial. Leaves runcinately pinnatifid with larger terminal lobe. Scapes usually fewer, with lax arachnoid-hairy tomentum below capitula. Involucres dark green, 12–15 mm long; outer involucral bracts ovate to broadly lanceolate, appressed to inner bracts and slightly wider than them, without cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, also without cornicle. Florets yellow. Achenes light brown; body 4.0–4.5 mm long, covered with acute tubercles in the upper third to fourth; cone 1.0–1.2 mm long; beak 9–11 mm long; pappus 6–7 mm long, white. Flowering July.

Alkaline meadows.—*Soviet Central Asia*: Tien Shan (eastern part), Dzhungaria-Tarbagatai. *General distribution*: probably found in regions bordering China. Described from Tekes River valley. Type in Leningrad (Herbarium of the All-Union Institute of Plant Industry).

Note. It is not one of the dandelions that in the past has occurred as a weed in “kok-sagyz” (*T. kok-saghyz*) plantations.

138. **T. eriopodum** (D. Don) DC. Prodr. VII (1838) 147; Hand.-Mazz. Monogr. Tarax. (1907) 69 and 168.—*Leontodon eriopodum* D.

Don in Mem. Wern. Soc. Edinb. III (1820) 413 and Prodr. Fl. Nepal. (1829) 163.—**lc.**: Hand.-Mazz. op. cit. t. 2, fig. 14 and t. 4, fig. 14.

Perennial. Plants 5–12 cm high, with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves, with more or less profuse lax tomentum of long flexuous hairs between bases of their petioles. Leaves glabrous or scatteredly hairy, usually pinnatipartite with wide, deltoid, lateral lobes, and much larger terminal lobe. Scapes solitary or few, more or less arachnoid pubescent, with lax arachnoid-hairy tomentum below capitula. Involucres 9–12 mm long, dark green; outer involucral bracts lanceolate to narrowly lanceolate, not closely appressed to inner bracts, as wide as inner or narrower than them, almost without scarious border, usually with small subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, often with short subterminal cornicle. Florets lemon-yellow. Achenes light brown; body about 4 mm long, with rather numerous and long acute tubercles in the upper half; cone about 1 mm long; beak about 6 mm long; pappus about 5 mm long, white. Flowering July to August.

Stony and loamy slopes, rocks, talus in upper mountain zone.—*Eastern Siberia*: Angara-Sayans (reported from Sayan Mountains); *Soviet Central Asia*: ?Pamiro-Alai. *General distribution*: Indo-Himalayas, Tibet, Mongolia. Described from Nepal. Type in London.

516 139. **T. rubtzovii** Schischk. sp. nova in Addenda, XXVIII, 741.

Perennial. Plants 3–12 cm high, with rather thick, often many-headed root; root collar glabrous. Leaves 4–10 cm long and 8–15 mm wide, glabrous, undivided, remotely large-toothed along margin to almost entire, Scapes entirely glabrous, less often with solitary flexuous hairs. Involucres 11–13 mm long at anthesis; outer involucral bracts broadly lanceolate to lanceolate, appressed to inner bracts or more or less separated in the upper part, almost as wide as inner bracts, light green, with more or less distinct pink tinge, with distinct venation, without cornicle; inner bracts oblong-linear, usually one and one-half times as long as longest outer bracts, green, dark at the apex; without or with indistinct cornicles. Florets light yellow; peripheral florets with wide dark (often dirty-lilac) stripe on the lower side of ligules; middle part of corolla with short appressed hairs. Mature achenes not known; body apparently with numerous longitudinal furrows and covered with acute tubercles almost from the base; pappus about 5 mm long, white. Flowering July to August.

Rubby and stony slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan (eastern part). Endemic? Described from Ketmen Range. Type (Ketmen-Tau Range, Komirchi natural boundary at about 3,200 m, 10.VIII.1946, N. Rubtzov) in Leningrad.

140. **T. perpusillum** Schischk. sp. nova in Addenda XXVIII, 742.

Perennial. Plants 1.5–6.0 cm high, with rather thick, often many-headed root; root collar glabrous or subglabrous. Leaves 2–6 cm long and 4–7 mm wide, glabrous, glaucescent-green, pinnatipartite with rather wide, often deflexed, entire or subentire lateral lobes, two to four on each side, and larger terminal lobe. Scapes with weak arachnoid pubescence in the upper part, often subglabrous. Involucres 7–10 mm long; outer involucral bracts fewer, broadly lanceolate to lanceolate, more or less appressed to inner bracts and almost as wide as inner bracts, membranous, with wide scarious border and occasional flexuous hairs, with or without indistinct subterminal cornicle; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, dark in the upper part, with or without indistinct cornicles. Florets light yellow or whitish(?), corolla glabrous; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light yellowish-brown; body 2.5–3.0 mm long, with fewer longitudinal ribs, covered with acute tubercles in the upper half, with few short and obtuse tubercles below; cone 0.2–0.4 mm long; beak 6–7 mm long; pappus about 5 mm long, whitish. Flowering August.

Clayey and rubbly slopes, gravel-beds in upper mountain zone.—*Soviet Central Asia: Dzhungaria-Tarbagatai*. Endemic? Described from the Dzhungarian Alatau. Type (Dzhungarian Alatau, slope of Sai-Teptek gorge, 23.VIII.1930, No. 595, L. Rodin) and isotype in Leningrad.

Section 3. Palustria (Dahlst.) Schischk. comb. nova.—*Taraxacum grex Palustria* Dahlst. In Lindm. Svensk. Fanerogamfl. ed. 2 (1926) 526.—Small or medium plants of plains, with more or less thick root, usually flowering in June–July; root collar glabrous. Leaves herbaceous. Scapes often entirely glabrous. Involucral bracts without cornicle; outer bracts fewer, appressed to inner and much wider than them; inner bracts one and one-half to two times as long as longest outer bracts. Florets yellow. Achenes light brown; body 3.5–4.5 mm long, usually with fewer and short acute tubercles in the upper part, relatively gradually terminating into 1–2 mm long cone; beak about 6.5–8.0 mm long, more than one and one-half times as achene body.

Type of section: *T. palustre* (Ehrh.) Dahlst. = *T. suecicum* Hagl.

141. **T. decolorans** Dahlst. in Arkiv för Botanik. XIX, 18 (1926) 8 and in Kungl. Sv. Vet. Akad. Handl. VI, 3 (192) 21.—**lc.**: Dahlst. *ibid.* fig. 5 and t. 3, fig. 1–7.—**Exs.**: Eston. pl. No. 187.

Perennial. Plants with rather thick vertical or ascending root. Leaves light green, glabrous, 6–15 cm long and 3–10 mm wide, undivided, sinuate-toothed, less often partly pinnatilobate, with rather long, more or

less pinkish-violet petioles. Scapes almost as long as leaves at anthesis, glabrous. Involucre 12–15 mm long, olive-green; outer involucre bracts broadly ovate to ovate-lanceolate, with rather wide, whitish or pinkish, scarious border, much wider than inner bracts and appressed to them, without cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, also without cornicle. Florets light yellow; ligules of peripheral florets similarly colored on both sides. Achenes light brown; body 3.5–3.8 mm long, with rather numerous acute tubercles in the upper half, only with fewer obtuse tubercles below; cone 1.4–1.5 mm long; beak about 7 mm long; pappus 7–8 mm long, white. Flowering June to July.

Wet meadows.—*European Part*: Baltic Region (Estonia). *General distribution*: Scandinavia. Described from Sweden. Type in Stockholm.

142. **T. suecicum** Hagl. in Göteb. K. Vetensk.-et Vitterh-Samh., Följd. 6, Ser. B, VII (1952) 364.—*Leontodon taraxacum palustre* Ehrh. Versuch 518 Verzeichn. Upsala Pfl. (1790) 4.—*Taraxacum palustre* (Ehrh.) Dahlst. in Bot. Notis. (1905) 145 and in Arkiv för Botanik. VII, 6 (1908) 8; Dahlst. in Kungl. Sv. Vet. Akad. Handl. VI, 3 (1928) 16, non Symons (1798).—*T. palustre* auct. non Symons: DC. Prodr. VII, 148 p. p.; Ldb. Fl. Ross. II, 815 p. p.—*T. paludosum* auct. non Schlecht.: Hand.-Mazz. Monogr. Tarax. (1907) 76 p. p.—*lc.*: Dahlst. op. cit. (1908) tab. 3, fig. 2 and op. cit. (1928) tab. 2, fig. 11–16.—*Exs.*: Dahlst. Tarax. scand. exs. fasc. IV, No. 7; Eston. pl. No. 188.

Perennial. Plants 5–25 cm high, with rather thick, ascending or vertical root. Leaves 4–12 cm long and 1–8 mm wide, glabrous, with rather long and narrow-winged petioles, undivided, more or less sinuate-toothed or entire. Scapes more or less ascending, glabrous. Involucre 9–13 mm long at flowering time, later 12–20 mm long; involucre bracts without cornicle; outer bracts usually dark green with rather wide, whitish or pinkish scarious border, ovate to ovate-lanceolate, more or less appressed to inner bracts and much wider than them; inner bracts oblong-linear, two times as long as longest outer bracts at flowering time. Florets yellow; peripheral florets with dark stripes on the lower side of ligule. Achenes light yellowish-brown; body 3.5–4.0 mm long, with fewer longitudinal furrows, covered with fewer short acute tubercles in the upper third, gradually terminating in 1.2–1.6 mm long cone, well separated from beak; beak 7–8 mm-long; pappus about 6 mm long, whitish, often with brownish tinge. Flowering May to June. (Plate XXV, Fig. 1).

Marshy meadows, usually near seacoast.—*European Part*: Baltic Region, ?Upper Dniester. *General distribution*: central Europe, Scandinavia. Described from Sweden. Type in Stockholm.

143. **T. lissocarpum** (Dahlst.), Dahlst. in Kungl. Sv. Vet. Akad. Handl. VI, 3 (1928) 24.—*T. palustre* subsp. *lissocarpum* Dahlst. in Arkiv

för Botanik. VII, 6 (1907) 16.—**lc.**: Dahlst. *ibid.* fig. 4 and (1928) *op. cit.* fig. 6 and t. 3, fig. 8–14.

Perennial. Plants with rather thick vertical root leaves glabrous, 7–18 cm long and 5–25 mm wide, usually pinnatipartite or pinnatilobate, with horizontal, entire lateral segments or lobes, and terminal lobe gradually narrowed into acute tip, without or almost without intermediate teeth, outer leaves in rosette often undivided, more or less toothed. Scapes glabrous, rather thick. Involucres 13–18 mm long; outer involucral bracts broadly ovate to broadly lanceolate, appressed to inner bracts and much wider than them, with whitish or pinkish scarious border, without cornicle; 519 inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, without cornicle. Florets yellow; peripheral florets with reddish stripes on the lower side of ligule. Achenes light yellowish-brown; body 4.0–4.5 mm long, only with fewer and shorter subacute tubercles in the upper part, sometimes only with obtuse tubercles; cone 1.2–1.5 mm long; beak 6.5–8.0 mm long; pappus 5–6 mm long. Flowering June to July.

Coastal meadows.—*European Part*: Baltic Region. *General distribution*: Scandinavia, Central Europe. Described from Sweden. Type in Stockholm.

Note. This species seems to occupy an intermediate position between *T. suecicum* and *T. balticum*.

144. **T. balticum** Dahlst. in Bot. Notis. (1905) 151 and 165; Dahlst. in Arkiv för Botanik. VII (1908) 3: Hand.-Mazz. Monogr. Tarax. (1907) 87.—**lc.**: Hand.-Mazz. *ibid.* t. 3, fig. 1 and t. 5, fig. 2; Dahlst. *op. cit.* (1908) t. 1 a–h, t. 2 t. 3, fig. 1.—**Exs.**: Eston. pl. No. 186; Pl. Finl. exs. No 397.

Perennial. Plants with rather thick, vertical or ascending root. Leaves glaucescent-green, somewhat thick, glabrous or subglabrous, more or less pinnatipartite, usually with rather narrow (to linear), horizontal or deflexed, lateral lobes, and smaller intermediate lobules or teeth between lobes. Scapes almost as long as leaves, 6–12 cm high, glabrous, less often with very weak arachnoid-hairy tomentum in the upper part, more or less reddish. Involucres 14–20 mm long; involucral bracts glaucescent-green, without cornicle; outer involucral bracts broadly ovate to lanceolate-ovate, appressed to inner bracts, and much broader than them, with narrow scarious border, usually more or less pinkish; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, more or less pinkish at apex. Florets pale yellow. Achenes yellowish-brown; body 4.0–4.5 mm long, with fewer, short, acute, tubercles only in the upper third; cone 1–2 mm long, beak 6.5–8.0 mm long; pappus 7–8 mm long, white. Flowering June to July.

Coastal meadows.—*European Part*: Baltic Region. *General*

distribution: Scandinavia, Central Europe, Atlantic Europe. Described from Estonia, Type in Stockholm.

Note. A very similar species, *T. egregium* Markl. (in *Acta bot. fennica*, XXIII (1938) 89, fig. 7), described from the Saaremaa and Mukhu islands in Estonia, differs from *T. balticum* by broader leaf lobes and a smaller (3.4–3.8 mm long) achene body.

Section 4. *Laevia* (Hand.-Mazz.) Schischk. comb. nova.—*Taraxacum* sect. *Borealia* subsect. *Gymnophylla* ser. *Laevia* Hand.-Mazz. Monogr. (1907) 70. —*T. grex Arctica* Dahlst. in Kungl. Sv. Vet. Akad. Handl. VI, 3 (1928) 55.—*T. grex Glabra* Dahlst. ibid. 59.—Smaller Arctic or alpine plants, with slender root, flowering in June–August. Leaves herbaceous; scapes entirely glabrous, at fruiting often more or less nodding. Involucral
520 bracts dark green, often blackish, without cornicle, less often partly with small cornicle, outer bracts fewer, more or less appressed to inner, less often more or less deflexed to recurved; inner bracts usually two and two and one-half times as long as longest outer bracts, less often one and one-half times as long. Florets yellow of different shades, corolla glabrous or subglabrous. Achenes light brown brownish or blackish-brown; body 3.5–4.5 mm long, with fewer, short, acute tubercles in the upper part, often smooth or almost smooth, less often with rather numerous acute tubercles, gradually terminating, in very short (0.4–0.6 mm long) cone; beak 3–7 mm long, usually two-thirds and more as long as achene body, less often almost two times as long.

Type of section: *T. nivale* Lge. ex Kihlm.

145. ***T. platylepium*** Dahlst. in Arkiv för Botanik. IV, 8 (1905) 34; Holmboe in Lynge. Vasc. pl. Nov. Zemlya (1923) 88.—*T. amblylepium* Dahlst. op. cit. 11, nom. nud.—**Ic.**: Dahlst. op. cit. fig. 8; Holmboe, op. cit. t. 29, fig. 4.

Perennial. Plants with rather thick vertical or ascending root. Leaves 4–8 cm long and 6–12 mm wide with rather long, wide-winged petioles, green, glabrous, subobtusely, undivided, with a few short and wide teeth along margin, less often entire. Scapes longer than leaves, glabrous. Involucres 14–16 mm long, dark green; outer involucral bracts ovate to broadly lanceolate, more or less appressed to inner bracts and slightly wider than them, more or less violet in the upper part, without cornicle; inner bracts narrowly oblong, usually two times as long as longest outer bracts, darker in the upper part, without cornicle. Florets yellow; peripheral florets with dark stripe on the lower side of ligule. Achenes brownish; body 4.5 mm long, with rather numerous longitudinal furrows, with shorter acute tubercles in the upper half; cone about 0.5 mm long, beak 3–5 mm long; pappus about 5–6 mm long, white. Flowering July to August.

Grassy patches, herb slopes, gravel-beds.—*Arctic*: Novaya Zemlya. Endemic. Described from Novaya Zemlya. Type in Stockholm.

146. *T. lyngeanum* Hagl. apud Steffen in Beih. Bot. Centralbl. LVIII, B (1938) 105; Hagl. in Nytt. Mag. Bot. V (1957) 9.—*T. gracilipes* Hagl. ibid. 7.—*Ic.*: Hagl. ibid. fig. 1–3.

Perennial. Plants 5–15 cm high, with slender root. Leaves 3–8 cm long and 4–8 mm wide, light green, glabrous, on rather long, narrowly winged petioles, acute or subacute, from undivided, sinuate-toothed to pinnatilobate with a few remote lateral lobes. Scapes usually longer than
521 leaves, glabrous. Involucres 9–12 mm long at flowering time, 12–15 mm long in fruiting, dark green; outer involucral bracts broadly ovate to lanceolate-ovate, more or less appressed to inner bracts, with narrow scarious border weakly demarcated from the remaining part of the bract, with or without very short, obtuse, subterminal cornicles; inner involucral bracts oblong-linear, two to two and one-half times as long as longest outer bracts, without or with small cornicle. Florets lemon-yellow, peripheral florets with dark stripe in the lower part of ligule. Achenes light brownish-yellow; body 3.5–4.0 mm long, with more numerous longitudinal furrows, covered with acute tubercles in the upper third, with short obtuse tubercles below, smooth near the base, rather gradually terminating in about 0.5 mm-long cone; beak 5–7 mm long; pappus white. Flowering July to August.

Meadows, herb slopes, gravel-beds.—*Arctic*: Novaya Zemlya. Endemic. Described from Novaya Zemlya (Belushya Inlet). Type in Oslo; isotype in Stockholm.

Note. I include *T. gracilipes* Hagl. as a synonym of this species, the type specimen of which, according to the original diagnosis, differs from *T. lyngeanum* only by the presence of very short cornicles on some involucral bracts and narrower inner involucral bracts. My description of the achenes pertains to the *T. gracilipes* specimen, whereas the *T. lyngeanum* specimens cited by the authors do not have mature achenes.

147. *T. turiense* Orlova sp. nova in Addenda XXVIII, 742.—*T. leucanthum* auct. non Ldb.: Hulten, Atlas Växt. Nord. (1950) 460, No. 1793.

Perennial. Plants with slender, often many-headed root; root collar glabrous. Leaves 3–18 cm long and 2–8 mm wide, glabrous, subacute, undivided, entire or with remote short teeth, gradually narrowed at base into more or less violet, narrowly winged petiole, slightly fleshy. Scapes one to seven, entirely glabrous, strongly elongated and usually nodding at fruiting. Involucres 10–13 mm long, glabrous; outer involucral bracts broadly lanceolate to narrowly lanceolate, green, sometimes with narrowly membranous border, more or less deflected from inner bracts to recurved

at fruiting, all or partly with small subterminal cornicle; inner bracts oblong-linear, two and one-half times as long as longest outer bracts, without or with a few cornicles. Florets light yellow. Achenes light brownish-gray; body 3.5–4.0 mm long, with rather numerous acute tubercles in the upper half, rather gradually terminating in about 1 mm-long cone; beak 4–5 mm long; pappus 5–7 mm long, often with yellowish tinge. Flowering June to July.

Stony slopes and rocks near seacoast.—*European Part*: Karelia-Lapland (Kola Peninsula). Endemic. Described from Kola Peninsula. Type (Murman Region, Turii Peninsula, near Cape Turii, 29.VII.1962, No. 64, N. Orlova) in Kirovsk (Polar-Alpine Botanic Garden).

522 **Note.** The diagnosis of this species was very kindly made available to me for publication by N.I. Orlova, who contributed the treatment of the genus *Taraxacum* Wigg. for the “*Flora Murmanskoi Oblasti*” [Flora of the Murmansk Region].

148. **T. nivale** Lge. ex Kihlm. in Meddel. Soc. pro fauna et flora fennica XVI (1889) 679; Hand.-Mazz. Monogr. Tarax. (1907) 70, p. p.—*T. glabrum* auct. non Dc.: Dahlst. in Arkiv för Botanik. IV, 8 (1905) 19, p. p—**!c.**; Hand.-Mazz. op. cit. t. 2, fig. 15; Dahlst. op. cit. fig. 6.

Perennial. Plants with slender root, entirely glabrous. Leaves 3–10 cm long and 6–15 mm wide, usually undivided, sinuate-toothed, less often partly shallow pinnatilobate. Scapes entirely glabrous, often nodding after anthesis. Involucres 8–13 mm long, dark green, more or less blackish; involucral bracts with or without small, dark, subterminal cornicle, outer bracts ovate to broadly lanceolate, more or less deflected from inner bracts to decurved, slightly wider than inner bracts or almost as wide as latter; inner bracts oblong-linear; usually two times as long as longest outer bracts. Florets yellow, peripheral florets with dark stripe on the lower side of ligule. Achenes brownish; body 4.0–4.5 mm long, with few, very short, acute tubercles above, often almost smooth, very gradually terminating in short cone; beak 5–6 mm long; pappus about 5 mm long, white. Flowering July to August.

Grassy patches and stony slopes.—*Arctic*: ?Arctic Europe, Arctic Siberia; *European Part*: Karelia-Lapland (Khibiny Mountains). Endemic. Described from Khibiny Mountains. Type in Copenhagen; isotype in Helsinki.

Note. Probably this species is endemic to the Kola Peninsula and is replaced by a similar species in other arctic areas.

149. **T. tundricola** Hand.-Mazz. in Russk. Bot. Zhurn. (1912) 174; Hand.-Mazz. in Oesterr. Bot. Zeitschr. LXXII (1923) 265; Schischk. in Kryl. Fl. Zap. Sib. XI, 3003.

Perennial. plants 5–25 cm high, with slender, often many-headed root; root collar glabrous. Leaves 3–12 cm long and 4–18 mm wide, glabrous, green, with long (often as long as lamina), narrowly winged petioles, undivided, more or less toothed (to subentire), less often pinnatilobate, with few entire lateral lobes. Scapes rather slender, glabrous. Involucres 8–12 mm long at flowering time, 10–16 mm long at fruiting, dark green, usually blackish; outer involucral bracts broadly lanceolate to narrowly lanceolate, more or less deflected from inner bracts (to recurved) and almost as wide as latter, almost without scarious border, without cornicle, less often with indistinct cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, more or less pinkish-violet at the apex, without or with very small blackish cornicle. Florets 523 light yellow or yellow(?), corolla glabrous; peripheral florets with weakly developed dark stripes on the lower side of ligule. Achenes immature, brownish, mature blackish-brown; body 3.5–4.5 mm long, with fewer longitudinal furrows, with few scarcely visible tubercles in upper part, almost smooth, very gradually terminating in short cone, well separated from beak; beak 4.5–5.0 mm long; pappus 5–6 mm long, whitish. Flowering July to August.

Wet grassy patches among rocks, stony slopes, gravel-beds.—*Arctic*: Arctic Europe (eastern part), ?Novaya Zemlya, Arctic Siberia. Endemic. Described from Kara tundra. Type in Leningrad.

Note. It is, possibly, a later synonym of *T. nivale* Lge. ex Kihlm. In Novaya Zemlya, it apparently is replaced by other arctic species.

150. ***T. glabrum*** DC. Prodr. VII (1838) 147; Ldb. Fl. Ross. II, 816; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 102 (Fl. baic.-dahur. No. 700); Holmboe in Lynge, Vasc. pl. Nov. Zemlya (1923) 87; Schishck. in Kryl. Fl. Zap. Sib. XI, 3003; Karavaev, Konsp. Fl. Yakut. 177.—*Hieracium glabrum* Turcz. ex DC. op. cit. 147 in syn.—*Taraxacum alpinum* auct. non Hegetschw. and Heer: Hand.-Mazz. Monogr. Tarax. (1907) 94, p. p.—**!c.**: Dahlst. in Arkiv för Botanik. IV, 8 (1905) 31, fig. 6 and in Kungl. Sv. Vet. Akad. Handl. VI, 3 (1928) t. 8.

Perennial. Plants 6–20 cm high, with rather thick root; root collar covered with blackish-brown remnants of dead leaves, glabrous. Leaves green, glabrous, 6–20 cm long and 6–20 mm wide, with long (almost as long as lamina) petioles, undivided, more or less sinuate-toothed to entire, obtuse or subobtuse. Scapes glabrous, less often subglabrous, solitary or two or three. Involucres 8–16 mm long at flowering time, dark green, more or less blackish; involucral bracts almost without scarious border, without or with indistinct, short subterminal cornicles, outer bracts lanceolate-ovate to lanceolate, slightly wider than inner or almost as wide as latter, more or less deflected from them to recurved; inner bracts oblong-

linear, two to two and one-half times as long as longest outer bracts. Florets yellow, turning pinkish upon drying; peripheral florets usually with dark stripe on the lower side of ligule; corolla subglabrous. Achenes light brown; body 3.5–4.0 mm long, entirely glabrous (less often near the apex with distinct tubercles), gradually terminating in short (about 0.6 mm long) cone, distinctly demarcated from the base; beak 5–7 mm long; pappus 5–6 mm long, whitish, often with brownish tinge. Flowering July to August.

Meadows, herb slopes, near banks of reservoirs in the Arctic and upper mountain zone.—*Arctic*: ?Novaya Zemlya, ?Arctic Siberia; *Western Siberia*: Altai (eastern part); *Eastern Siberia*: all regions; *Far East*: Okhotsk, ?Zeya-Bureya. Endemic. Described from Baikal Region ("Nukhu-Daban"). Type and isotypes in Leningrad.

524 **Note.** In the flowering stage, it is readily confused with other arctic species. Because of this, the distribution area of *T. glabrum* needs to be verified.

151. ***T. atratum*** Schischk. sp. nova in Addenda XXVIII, 743.

Perennial. Plants with slender, vertical or ascending root; root collar covered with brownish remnants of dead leaves. Leaves 3–8 cm long and 4–12 mm wide, gradually narrowed at base into narrowly winged petiole, obtuse or subacute, undivided, sinuate-toothed, less often entire or shallow lobate. Scapes solitary or few, almost as long as leaves, entirely glabrous, usually nodding after flowering. Involucres 10–14 mm long; involucral bracts herbaceous, often dark green, with very narrowly membranous border, without or with indistinct, very short, subterminal cornicle; outer involucral bracts ovate to ovate-lanceolate, appressed to inner bracts and somewhat wider than them, inner bracts two times as long as longest outer, oblong-linear. Florets light yellow, peripheral florets with wide dark (usually lilac) stripe on the lower side of ligules; corolla subglabrous, with occasional short hairs in the upper part of tube and in the lower part of limb. Achenes light brown; body 3.5–4.0 mm long, with fewer and shorter, acute, tubercles, only in the upper fourth; cone 0.4–0.5 mm long; beak 4–6 mm long; pappus 5–6 mm long, white. Flowering July to August.

Clayey and rubbly slopes, gravel-beds in alpine zone of mountains.—*Soviet Central Asia*: Dzhungaria-Tarbagatai. *General distribution*: possibly found in areas bordering China. Described from Dzhungarian Alatau. Type (Dzhungarian Alatau, Koksus River basin, left bank of middle reaches of Kazan River, 30.VIII.1948, V. Goloskokov) and isotypes in Leningrad.

152. ***T. subglaciale*** Schischk. sp. nova in Addenda XXVIII, 743.

Perennial. Plants 3–8 cm high, with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves,



glabrous. Leaves 3–8 cm long and 3–8 mm wide, glabrous, green, with long, narrowly winged petioles, remotely pinnatilobate with entire, more or less subacute lateral lobes, two to four on each side. Scapes entirely glabrous, nodding after flowering. Involucres 10–14 mm long, rather narrow; outer involucral bracts broadly lanceolate to lanceolate, appressed
 526 to inner bracts, almost as wide as inner bracts or slightly narrower, with wide scarious border, without cornicle, less often partly with indistinct cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, darker at apex, without or with indistinct cornicle. Florets yellow or light yellow(?), peripheral florets with a dark stripe on the lower side of ligule. Achenes light brownish-green; body 3.5–4.3 mm long with few longitudinal furrows, with a few scarcely distinct tubercles in the upper part only, almost smooth, gradually terminating in about 0.5 mm long cone, well demarcated from beak; 3.5–5.0 mm-long; pappus about 5 mm long, white. Flowering July to August.

Clayey and stony slopes of upper mountain zone.—*Soviet Central Asia*: Dzhungaria-Tarbagatai. Endemic? Described from Dzhungarian Alatau. Type (Dzhungarian Alatau, Koksū River basin, water divide of Arasan and Tentekskaya rivers, 14.VIII.1948, V. Goloskokov) in Leningrad.

153. **T. arcticum** (Trautv.) Dahlst. in Arkiv för Botanik. IV, 8 (1905) 8; Holmboe in Lynge, Vasc. Fl. Nov. Zemlya (1923) 85; Schischk. in Kryl. Fl. Zap. Sib. XI, 3002; Karavaev, Konsp. Fl. Yakut. 177.—**lc.**: Dahlst. op. cit. fig. 2.

Perennial. Plants with slender root, entirely glabrous. leaves 3–10 cm long and 6–15 mm wide, runcinately pinnatipartite or pinnatilobate with horizontal, more or less deflexed lateral lobes. Scapes entirely glabrous, solitary or few. Involucres 9–12 mm long, dark green, more or less blackish; involucral bracts without cornicle; outer bracts broadly ovate to lanceolate-ovate, not closely appressed to inner bracts and wider than them; inner bracts oblong-linear, usually to times as long as longest outer bracts. Florets yellow or light yellow(?); peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown, later turning dark brown; body about 4.5 mm long, with fewer, very short, acute or subobtus tubercles in the upper third, sometimes, almost smooth, very gradually terminating in short (about 0.5 mm long) cone; beak 4–5 mm long; pappus about 6 mm long, white. Flowering July to August.

Grassy patches, stony and clayey slopes, gravel-beds.—*Arctic*: Arctic Europe (eastern part), Novaya Zemlya, Arctic Siberia; *Eastern siberia*: Lena-Kolyma (northern part). *General distribution*: Spitsbergen, eastern Greenland. Described from Novaya Zemlya. Type and isotype in Leningrad.

154. **T. sibiricum** Dahlst. in Arkiv. för Botanik, IV, 8 (1905) 36; Karavaev, Konsp. Fl. Yakut. (1958) 178.—**!c.**: Dahlst. op. cit. fig. 9.

Perennial. Plants with rather thick root. Leaves 4.5–10.0 cm long and 8–18 mm wide, pale green, glabrous or subglabrous on long, narrowly winged petioles, runcinately deeply pinnatipartite, lateral lobes entire or
527 more or less toothed along anterior margin, three to five on each side, terminal lobe somewhat larger. Scapes glabrous. Involucre 12–13 mm long, dark green; outer involucral bracts broadly ovate to lanceolate-ovate, usually not closely appressed to inner bracts and wider than them, more or less violet in the upper part, without cornicle; inner bracts oblong linear, one and one-half to two times as long as longest outer bracts, without cornicle. Florets yellow; peripheral florets with reddish stripes in the lower part of ligule. Achenes brownish; body 3.5–4.0 mm long, with a few longitudinal furrows, with fewer, short, acute tubercles in the upper third, rather gradually terminating in about 0.5 mm-long cone; beak 4.5–5.0 mm long; pappus 5–6 mm long, white. Flowering July to August.

Meadows, gravel-beds, along banks of reservoirs.—*Arctic*: Arctic Siberia (eastern part); *Eastern Siberia*: Lena-Kolyma. Endemic. Described from lower reaches of Lena River (near village of Bulun). Type in Stockholm.

155. **T. kamtschaticum** Dahlst. In Arkiv för Botanik. XX, A, 1 (1925) 2; Hult. in Kungl. Sv. Vet. Akad. Handl. VIII, 2 (1930) 233; Kom. Fl. Kamtch. III (1930) 191.—**!c.**: Dahlst. op. cit. fig. 1.

Perennial. Plants 5–15 cm high, with rather slender root; root collar glabrous. Leaves 4–10 cm long and 4–18 mm wide, with long (often longer than lamina) almost wingless petioles, glabrous, lyrate pinnatipartite or pinnatilobate, with more or less deflexed, obtuse, lateral segments or lobes, two or three on each side, and usually larger, likewise, obtuse, terminal lobe. Scapes entirely glabrous. Involucres 7–12 mm long, dark green, often more or less blackish; outer involucral bracts fewer, ovate or lanceolate-ovate, appressed to inner bracts (but in fruits more or less deflected to deflexed), as wide or slightly wider than them, with very narrow scarious border, without cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, without cornicle. Florets light yellow, almost without dark stripe on the outer side of ligule, slightly pinkish in dry state. Achenes brownish; body 3.5–4.0 mm long, almost smooth, with solitary short acute tubercles only in the upper part, gradually terminating in short (0.5 mm long) cone, well demarcated from beak; beak 5–7 mm long; pappus about 5 mm long, whitish, usually with brownish tinge. Flowering June to July. (Plate XXVI, Fig. 4).

Wet meadow, gravel-beds, along banks of reservoirs.—*Arctic*: Chukotka, Anadyr; *Far East*: Kamchatka?, Okhotsk. *General distribution*: Aleutian Islands. Described from Kamchatka. Type in Stockholm.

Section 5. Porphyrantha Schischk. Sect. nova in Addenda, XXVIII, 528 744.—*Taraxacum* sect. *Orientalia* Hand.-Mazz. in Oesterr. Bot. Zeitschr. 6–8 (1923) 274. p. p.— Small or medium alpine plants with more or less thick root, flowering in June–August; root collar glabrous. Leaves herbaceous. Scapes usually entirely glabrous. Involucral bracts without or with small coriaceous, outer bracts fewer, appressed to inner or more or less deflexed; inner bracts one and one-half to two times as long as longest outer bracts. Florets pink or purple. Achenes light brown; body 3–4 mm long, covered with more or less numerous, acute, tubercles in the upper part, rather abruptly terminating into 0.4–0.8 mm long cone; beak 3–8 mm long, usually one and one-half times and more as long as body of achene, less often (possibly on immature achenes) only slightly longer than it.

Type of section: *T. porphyranthum* Boiss.

156. *T. porphyranthum* Boiss. Fl. or. III (1875) 790; Hand.-Mazz. Monogr. Tarax. (1907) 122, p. p; Schischk. in Grossh. Fl. Kavk. IV (1934) 246; Grossh. Opred. Rast. Kavk. (1949) 512; Kapeller in Fl. Gruzii, VIII (1952) 659; Sofieva in Fl. Azerb. VIII (1961) 543.—*lc.*: Hand.-Mazz. op. cit. t. 3, fig. 14.

Perennial. Plants 6–20 cm high, with rather thick, sometimes many-headed root; root collar glabrous. Leaves 4–15 cm long and 6–18 mm wide, glabrous, green runcinately pinnatifid, with rather wide, more or less deflexed, usually entire, three to five lateral lobes on each side, and larger terminal lobe. Scapes glabrous or with occasional hairs below capitula. Involucres 10–15 mm long, dark green; outer involucral bracts oblong-ovate to oblong-lanceolate, appressed to inner bracts and slightly wider than them, with rather wide scarious border, more or less pinkish in the upper part, with small (sometimes rather large) dark subterminal coriaceous or partly without; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, with or without more or less large dark subterminal coriaceous. Florets pink or purple. Achenes light brown; body 3.5–4.0 mm long, with fewer longitudinal furrows, covered with acute tubercles in the upper third; cone 0.4–0.8 mm long, well demarcated from beak; beak 6–8 mm long; pappus 6–7 mm long, white. Flowering July to August.

Meadows, stony slopes in upper mountain zone.—*Caucasus*: Ciscaucasia, Dagestan, Eastern and Western Transcaucasia. Endemic. Described from Greater Caucasus Range. Type in Leningrad.

Note. It apparently segregates into several ecogeographic races differing in the shape of the leaves, structure of the involucre, and the size of the achenes.

157. **T. pseudoroseum** Schischk. sp. nova in Addenda, XXVIII, 744.

529 Perennial. Plants 6–25 cm high, with slender root; root collar glabrous. Leaves 4–15 cm long and 8–25 mm wide, glabrous, green, gradually narrowed at the base into winged petiole; undivided, remotely sinuate-toothed (sometimes partly entire) to pinnatilobate with wide, entire or subentire, two to five lateral lobes on each side, and much larger terminal lobe. Scapes two or three, glabrous, less often subglabrous. Involucres 14–20 mm long, green; outer involucral bracts lanceolate-ovate to lanceolate, more or less deflected from inner bracts (often recurved), and almost as wide as inner bracts, with very narrow scarious border, without cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, dark green, without cornicle. Florets pink or light lilac(?), peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body about 3 mm long, more or less covered with acute tubercles in the upper half, only with few, very short, obtuse tubercles below; cone about 0.5 mm long; beak 6–8 mm long; pappus 6–7 mm long, whitish, often with brownish tinge. Flowering June to July.

Stony slopes, grassy patches, gravel-beds, in upper mountain zone.—*Soviet Central Asia*: Tien Shan (eastern part). Endemic. Described from Kungei-Alatau Range. Type (northern spurs of Kungei-Alatau, Chet-Norke George, 1.VII.1937, V. Goloskokov) and isotype in Leningrad.

158. **T. lilacinum** Krassn. ex Schischk. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VII (1937) 4.—*T. glabrum* var. *lilacina* Krassn. Spisok. Rast. Sobrannykh v Vost. Tyan-Shan Letom 1886 g. (1887?) 76, nom. nud.—*T. porphyranthum* auct. non Boiss.: Hand.-Mazz. Monogr. Tarax. (1907) 122, p. p.

Perennial. Plants with slender, ascending or vertical root; root collar with fewer remnants of dead leaves, with a small quantity of long flexuous hairs in their axil. Leaves glabrous, 3–12 cm long and 5–17 mm wide, with rather long (often as long as lamina) narrow-winged petioles, undivided, entire or with remote short teeth, less often pinnatilobate with few, rather wide lateral lobes. Scapes one or two, glabrous, usually slightly longer than leaves. Involucres 9–14 mm long, dark green; outer involucral bracts ovate-lanceolate to lanceolate, not closely appressed to inner bracts or more or less deflected from them, almost as wide or slightly wider than them, with narrow scarious border, without cornicle; inner bracts oblong-linear one and one-half to times as long as longest outer bracts, without or with indistinct cornicle. Florets pink or lilac, corolla entirely

glabrous. Achenes light brown; body about 3 mm long, with fewer and short acute tubercles in the upper fourth; cone 0.5–0.7 mm long, well demarcated from beak; beak 3–4 mm long; pappus about 6 mm long, whitish. Flowering June to August.

Rubbly and stony slopes, alpine grassy patches, forest glades near upper boundary of forest and above.—*Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan (eastern part), Pamiro-Alai (eastern part). *General distribution*: areas bordering China. Described from eastern Tien Shan (Khan-Tengri Mountain). Type in Leningrad.

Section 6. Scariosa Hand.-Mazz. Monogr. Tarax. (1907) 33 p. p.—Medium plants of plains and lower mountains, with thick, usually many-headed main root, flowering in August–October, sometimes also second time in May–June; root collar with rather profuse brownish tomentum in leaf axil. Leaves herbaceous. Scapes more or less arachnoid pubescent below capitula. Involucral bracts without or with small cornicle; outer involucral bracts fewer, membranous, more or less appressed to inner bracts, latter two to two and one-half times as long as longest outer bracts. Florets yellow of different shades. Achenes usually light brown, covered with rather numerous acute tubercles, more abruptly terminating into 0.8–1.5 mm long cone; beak about 4–8 mm long, less often almost two times as long as achene body.

Lectotype of section: *T. megalorrhizon* (Forsk.) Hand.-Mazz.

159. **T. hybernium** Stev. in Bull. Soc. Nat. Mosc. XXIX, 4 (1856) 410.—*T. gymnanthum* auct. non DC.: Schmalh. Fl. II, 149; Stank. and Tal. Opred. Vyst. Rast. (1949) 692.—*T. megalorrhizon* (Forsk.) Hand.-Mazz. Monogr. Tarax. (1907) 35, p. p.—**Exs.**: GRF No. 220.

Perennial. Plants 5–15 mm high, with rather thick vertical root; root collar covered with brownish remnants of dead leaves, with more or less profuse brownish tomentum in their axil. Leaves 4–10 cm long and 6–20 mm wide, subglabrous or glabrous; runcinately pinnatipartite with rather numerous, deflexed, often toothed lateral lobes, and smaller terminal lobe. Scapes solitary or two to five, weakly arachnoid pubescent below capitula, less often entirely glabrous. Involucres 8–15 mm long; outer involucral bracts lanceolate-ovate to lanceolate, not closely appressed to inner bracts (at fruiting often recurved), and almost as wide as inner, green, with wide scarious border, without or with indistinct cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, dark green, without or with indistinct cornicle. Florets yellow, peripheral florets with wide dark stripe on the lower side of ligule; corola glabrous. Achenes light yellowish-brown; body about 4 mm long, with

fewer longitudinal furrows, with rather large, acute, tubercles in the upper third, only with short, obtuse, tubercles below; beak 4.0–6.5 mm long; pappus 4–5 mm long, whitish, often with brownish tinge. Flowering May, August to December.

Dry stony (mostly shale) slopes near seacoast.—*European Part*: Crimea (southern part). Endemic. Described from Crimea. Type in Helsinki.

Economic Importance. The milky sap (latex) of this species contains a relatively high percentage of rubber. According to M.I. Kotov, on the average, the quantity of rubber, converted to dry biomass in the roots of natural stands of “krym-Saghyz” constitutes, on the average, about 4–6%. Under cultivation, during the first year, the rubber content varies about 1%, but by the end of the second year it increases sharply, reaching up to 8% of dry root biomass. As a rubber plant, this species was discovered in 1931 by M.I. Kotov and V.I. Cherkasov. Extensive literature is available on the biology and cultivation possibilities of “krym-Saghyz.”

160. **T. pobedimoviae** Schischk. sp. nova in Addenda XXVIII, 744.

Perennial. Plants 6–20 cm high, with very thick, usually many-headed root; root collar covered with dark brown remnants of dead leaves, with rather profuse brownish tomentum in their axil. Leaves 2–8 cm long and 4–8 mm wide, scatteredly hairy to subglabrous, from undivided, more or less toothed to pinnatifid with fewer more or less deflexed lateral lobes and much larger terminal lobe, plant often weakly developed at anthesis. Scapes usually few, slender, with lax arachnoid-hairy tomentum only below capitula. Involucres 8–15 mm long, glaucescent-green; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts and almost as wide as the latter, with rather wide, scarious border and short cilia, with or with or without very short and obtuse, dark subterminal cornicle. Florets orange-yellow, corolla subglabrous; peripheral florets with wide pinkish tripe on the lower side of ligule. Achenes brownish; body about 4 mm long, with fewer longitudinal furrows, covered with fairly large acute tubercles in the upper third; only with very short and obtuse tubercles below (almost up to base); cone 1.0–1.4 mm long; beak 7–8 mm long; pappus about 5 mm long; whitish, with brownish tinge. Flowering August to September.

Clayey and limestone slopes.—*European Part*: Crimea (Sevastopol District). Endemic. Described from vicinity of Sevastopol. Type (vicinity of Sevastopol, Kamyshevaya Inlet, on clayey-limestone precipice facing the sea, 25.VIII.1962, No. 484, E. Pobedimova and V. Gladkova) in Leningrad.

161. **T. ciscaucasicum** Schischk. sp. nova in Addenda XXVIII, 745.—

T. megalorrhizon auct. non Hand.-Mazz.: Schischk. in Grossh. Fl. Kavk. IV (1934) 249; Grossh. Opred. Rast. Kavk. (1949) 249.

Perennial. Plants with rather thick, often many-headed root; root collar with profuse lax tomentum between bases of petioles of living and dead leaves. Leaves somewhat thick, glabrous or somewhat pubescent, green, 2–6 cm long and 1.0–1.5 cm wide, pinnatipartite, with fewer, wide, deltoid lateral lobes, often with smaller intermediate lobules, sometimes partly undivided, sinuate-toothed lobules. Scapes 4–10 cm high, covered with rather lax arachnoid-hairy tomentum almost all-over, later only in the upper part. Involucres about 10 mm long; outer involucral bracts ovate to lanceolate-ovate, more or less appressed to inner bracts and slightly wider than them, with scarious border, olive-green, sometimes reddish in the upper part, with short, not always well developed subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, usually with short subterminal cornicle. Florets lemon-yellow, with lilac or reddish stripe on the lower side of ligule. Achenes light brown; body about 4 mm long, with rather numerous acute tubercles in the upper half; cone 1.0–1.5 mm long; beak 4–7 mm long; pappus 6 mm long, whitish or with weak brownish tinge. Flowering July to September.

Alkaline meadows. *Caucasus*: Ciscaucasia. Endemic. Described from Stavropol Territory. Type (Stavropol Territory, vicinity of Blagodatnoe, collector unknown) in Leningrad.

Section 7. Rhodotricha Hand.-Mazz. Monogr. Tarax. (1907) 16, p. p.—Small and medium plants of plains or lower mountains, less often alpine, with rather thick, often many-headed root, flowering usually in July–September; root collar with brownish tomentum in axils of leaves, less often subglabrous. Leaves herbaceous. Scapes glabrous or with lax arachnoid-hairy tomentum below capitula. Involucral bracts without cornicle, less often with small cornicle; outer bracts fewer, more or less appressed to inner; inner bracts one and one-half to two times as long as longest outer bracts. Florets yellow. Achenes light brown; body 4–5 mm long, covered with fewer, short, acute, tubercles in the upper part, sometimes almost smooth, rather gradually terminating in 0.4–1.6 mm-long cone; beak 2.5–7.0 mm long, usually shorter or slightly longer than achene body, less often almost one and one-half times as long; pappus often with brownish tinge.

Lectotype of section: *T. bessarabicum* (Hornem.) Hand.-Mazz.

- 535 162. ***T. bessarabicum*** (Hornem.) Hand.-Mazz. Monogr. Tarax. (1907) 26; Schischk. in Grossh. Fl. Kavk. IV(1934) 247; Schischk. in Fl. Yugo-Vost. VI, 461; Schischk. in Kryl. Fl. Zap. Sib. XI, 2998; Grossh. Opred. Rast. Kavk. (1949) 512; Klovov in Vizn. Rosl. URSR (1950) 592;

Kovalevskaya in Fl. Uzb. VI, 463.—*Leontodon bessarabicus* Hornem. Hort. Hafn. Suppl. (1819) 88; Fisch. Catal. Horti Gorenk. (1812) 34 nom. nud.; Ldb. Fl. alt. IV, 153.—*L. lividus* auct. non Waldst. and Kit.: MB. Fl. taur.-cauc. III (1819) 531.—*L. salsus* Bess. ex Link, Enum. pl. horti berol. II (1822) 283; in syn.—*Taraxacum salinum* Bess. Enum. pl. Volhyn. (1822) 31.—*T. leptcephalum* Rchb. Fl. Germ. exec. (1830–1832) 270.—*T. procumbens* Less. in Linnaea IX (1835) 181.—*T. erythrospermum* β . *bessarabicum* (Hornem.) DC. Prodr. VII (1838) 147.—*T. palustre* β . *intermedium* DC. ibid, 148.—*T. palustre* auct. non DC.: Ldb. Fl. Ross. II (1846) 815, p. p.—**Ic.**: Rch. Ic.: Fl. Germ. XIX, t. 55, fig. 4: Hand.-Mazz. op. cit. t. 1, fig. 7.

Perennial. Plants with rather thick, simple or many-headed root; root collar covered with dark brown remnants of dead leaves, usually somewhat woolly. Leaves erect, less often appressed to ground, more or less thickish, glabrous, 5–12 cm long and 5–25 wide, sinuate-toothed or pinnatilobate, less often subentire. Scapes 5–20 cm high, often several, straight or ascending, glabrous or with lax arachnoid-hairy tomentum below capitula. Involucres 8–13 mm long; involucre bracts herbaceous, green, often with reddish tinge, without or with indistinct subterminal cornicle; outer bracts lanceolate to lanceolate-linear, appressed to inner bracts and as wide as or narrower than them, with scarious margin; inner involucre bracts oblong-linear, usually two times as long as longest outer bracts. Florets yellow; peripheral florets usually with orange tinge, scatteredly short hairy in the middle part of corolla. Achenes light grayish-brown, body 4–5 mm long, with rather fewer, acute, tubercles in the upper third; cone 1.2–1.6 mm long, more gradually tapering from body of achene; beak 3–5 mm long; pappus about 5 mm long, usually with weak brownish tinge. Flowering July to October.

Alkaline and saline meadows, gravel-beds, along banks of reservoirs, sometimes on outcrops of chalk or limestone.—*European Part*: Volga-Kama, Trans-Volga, Volga-Don, Middle Dnieper, Bessarabia, Black Sea Region, Lower Don, Lower Volga, Crimea; *Caucasus*: Ciscaucasia, ? Eastern Transcaucasia, ?Talysh; *Western Siberia*: Upper Tobol, Irtysh, Altai; *Eastern Siberia*: Angara-Sayans; *Soviet Central Asia*: Aralo-Caspian, Balkhash Region, Dzhungaria-Tarbagatai, Tien Shan, mountainous Turkmenia. *General distribution*: central Europe, Mediterranean Region, Balkans-Asia Minor, Iran-Afghanistan, Dzhungaria-Kashgaria, Mongolia, Tibet. Described from cultivated specimens originating, apparently, from Moldavia. Type in Copenhagen; isotype(?) in Leningrad.

163. **T. oliganthum** Schott and Kotschy ex Hand.-Mazz. Monogr. Tarax. (1907) 32; Grossh. Opred. Rast. Kavk. (1949) 513; Sofieva in Fl. Azerb. VIII, 540, in note.—**Ic.**: Hand.-Mazz. op. cit. t. 1, fig. 10.

Perennial. Plants 4–6 cm high, with rather thick, often many-headed root; root collar covered with brownish remnants of dead leaves, with more or less profuse brownish tomentum in their axil. Leaves numerous, coriaceous-herbaceous, with rather dense pubescence of very short hairs in the lower part and much weaker in the upper part, 8–15 mm wide, usually pinnatilobate or pinnatipartite, with more or less deflexed, entire or subentire lateral ones, sometimes with small intermediate lobules. Scapes often 4–10, more or less covered with rather lax tomentum, shorter than leaves or almost as long. Involucres 8–12 mm long; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts, almost as wide or slightly wider than them, with rather wide scarious border, often pinkish, without or with indistinct cornicle; inner bracts oblong, linear, usually one and one-half to two times as long as longest outer bracts, without cornicles. Florets yellow, peripheral florets with reddish stripes on lower side of ligules. Mature achenes not known; body about 5 mm long, with fewer acute tubercles in the upper part; beak apparently short, somewhat thick, pappus about 6 mm long, usually with whitish tinge. Flowering July to August.

Meadows, stony and rubbly slopes, gravel-beds in upper mountain zone.—*Caucasus*: ?Eastern Transcaucasia, Southern Transcaucasia (eastern part). *General distribution*: Asia Minor, Armenia and Kurdistan, Iran-Afghanistan, Syria. Described from Turkey. Type in Vienna.

164. **T. daralagesicum** Schischk. sp. nova in addenda XXVIII, 745.

Perennial. Plants with rather thick, many-headed root; root collar covered with numerous dark brown remnants of dead leaves, with more or less profuse brownish tomentum between bases of their petioles. Leaves green, more or less covered with scattered crisped hairs to entirely glabrous, 5–2 cm long and 0.5–3.0 cm wide, from undivided, more or less sinuate-toothed to pinnatilobate or pinnatipartite with few, usually entire and long-acuminate lateral lobes, and much larger and wider terminal lobes. Scapes numerous, as long as or slightly longer than leaves, more or less arachnoid-hairy-tomentose, with more profuse arachnoid-hairy tomentum below capitula. Involucres 10–13 mm long; outer involucral bracts broadly lanceolate to lanceolate, more or less deflected from inner bracts and almost as wide as the latter, membranous, light green, with wide whitish border, more or less purple and scatteredly hairy at apex, without cornicle; inner bracts oblong-linear, two and one-half to three times as long as longest outer bracts, green, herbaceous, with whitish scarious border; dark at apex, without cornicle. Florets yellow, peripheral florets with wide dark stripe on the lower side of ligule; corolla profusely hairy in the middle part. Achenes light yellowish-brown; body 4–5 mm long, with inconspicuous ribs; smooth or almost smooth (with

few, very short, acute, tubercles in the upper part), gradually terminating into cone, which in turn also gradually terminates in somewhat thick, 2.5–4.0 mm-long beak; pappus 5–6 mm long, whitish, usually with very weak brownish tinge. Flowering August to September.

Dry slopes, gravel-beds.—*Caucasus*: Southern Transcaucasia (Daralgez). Endemic. Described from Daralgez. Type (Armenia, village of Okbadyr-Alagez, 8.IX.1931, I. Karjagin and B. Sofiev) in Leningrad; isotypes in Leningrad and Baku.

165. **T. stenolepium** Hand.-Mazz. Monogr. Tarax. (1907) 121; Schischk. in Grossh. Fl. Kavk. IV (1934) 247; Grossh. Oprod. Rast. Kavk. (1949) 512; Sofieva in Fl. Azerb. VIII, 542.—*T. corniculatum* auct.: DC. Prodr. VII (1838) 146, p. p.; Ldb. Fl. Ross. II, 813, p. p., non *Leontodon corniculatus* Kit. (1814).—*Ic.*: Hand.-Mazz. op. cit. t. 3, fig. 13.

Perennial. Plants 5–25 cm high, with rather thick, often many-headed root; root collar covered with dark brownish remnants of dead leaves, glabrous or subglabrous. Leaves 5–20 cm long and 8–25 mm wide, green, glabrous, gradually narrowed at the base into rather long, narrow-winged petiole, from undivided, sinuate-toothed to pinnatipartite with entire or more less toothed, two to five lateral lobes on each side, and larger terminal lobe. Scapes more or less covered with arachnoid-hairy-tomentum below capitula. Involucre 9–15 mm long; outer involucral bracts lanceolate-ovate to lanceolate, not closely appressed to inner bracts or somewhat deflected from them, almost as wide as inner bracts, membranous, with wide whitish border, with small subobtusate subterminal cornicle or partly without; inner bracts oblong-linear, usually two times as long as longest outer bract, dark green, with small, dark, subterminal cornicle, partly without. Florets light yellow, corolla short-hairy in the middle; peripheral florets with dark stripe on the lower side of ligule. Achenes light brown; boy 4–5 mm long, with fewer longitudinal furrows; covered with fewer and short acute tubercles in the upper third, gradually terminating in wide conical, 0.4–0.6 mm-long cone, well demarcated from beak; beak 4–7 mm long; pappus 5–6 mm long, often with brownish tinge. Flowering July.

Meadows, stony slopes in upper and middle mountain zones.—*Caucasus*: Eastern and Southern Transcaucasia. *General distribution*: 536 Armenia and Kurdistan, Iran-Afghanistan?, Indo-Himalayas. Described from Caucasus. Lectotype (Karabagh orient., 1829, Szowits) and isotypes in Leningrad.

166. **T. voronovii** Schischk. sp. nova in Addenda XXVIII, 746.

Perennial. Plants 2–12 cm high, with thick, usually many-headed root; root collar covered with numerous dark brown remnants of dead leaves, with profuse brownish tomentum in their axils. Leaves 3–10 cm long and

grayish-green, covered with scattered crisped hairs on both surfaces, pinnatilobate to pinnatipartite, with narrow or rather wide, often toothed lateral segments or lobes. Scapes one to five, covered with arachnoid-hairy-tomentum up to flowering time, later more or less glabrescent but always more or less tomentose below capitula, rather slender. Involucral bracts 8–14 mm long, slightly glaucescent; involucral bracts often weakly hairy or glabrous in the upper part, without cornicle; outer bracts lanceolate to lanceolate-linear, not closely appressed to inner bracts, almost as wide as latter or slightly narrower, with narrow scarious border, often long-acuminate; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts. Florets light yellow or yellow(?), corolla short hairy in the middle part, peripheral florets with weaker dark stripes on the lower side of ligule. Achenes light brown; body about 4 mm long, with fewer longitudinal furrows, covered with very short, acute tubercles in the upper third, latter coalescent in transverse wrinkles, with more or less distinct obtuse tubercles below, very gradually terminating in 0.6–0.8 mm-long cone, well demarcated from beak; beak 4.5–7.0 mm long pappus about 6 mm long, white. flowering August to September.

Dry herb slopes, pastures, roadsides.—*Caucasus*: Western Transcaucasia (eastern part), Eastern Transcaucasia (western part). Endemic. Described from South Osetia. Type (South Ossetia, near village of Chreb, 1.IX.1923, No. 870, S. Juzepczuk) in Leningrad.

Note. A very distinct species, to a considerable extent coming closer to species of sections *Scariosa* and *Spuria*.

167. **T. fedtschenkoi** Hand.-Mazz. Monogr. Tarax. (1907) 167.

Perennial. Plants with rather thick, often many-headed, root collar covered with brownish remnants of dead leaves, with more or less profuse lax tomentum of long flexuous hairs in their axils. Leaves 5–10 cm long and 10–25 mm wide, grayish-green, somewhat thick, scatteredly hairy or glabrous, runcinately pinnatipartite with more or less deflexed, often more or less toothed lateral lobes and somewhat larger terminal lobe. Scapes several, slender, more or less arachnoid pubescent, with lax arachnoid-hairy tomentum below capitula. Involucres 8–15 mm long, grayish-green, usually with scattered crisped hairs; outer involucral bracts ovate to broad-lanceolate, appressed to inner bracts, later more or less deflexed to recurved, almost as wide as the latter or slightly wider, without scarious border, with short, not always distinct subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, usually with short subterminal cornicle. Florets lemon-yellow, peripheral florets with darker stripe on the lower side of ligule, short and scatteredly hairy in the middle part of corolla. Achenes light brown, body 4–5 mm long, with numerous but rather short, acute tubercles in the upper

half; with much shorter obtuse tubercles below; cone 0.8–1.4 mm long; beak 2.5–4.5 mm long, well demarcated from cone; pappus about 6–7 mm long, white. Flowering July to August.

Stony and loamy slopes, talus and grave-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (Alai and Trans-Alai ranges), ?Tien Shan. Endemic. Described from the Alai Range. Lectotype (Alai Range, Taldyk Pass, 12.VIII.1901, B. and O. Fedtschenko) in Leningrad.

168. **T. varsobicum** Schischk. sp. nova in Addenda XXVIII, 747.

Perennial. Plants 4–10 cm high, with rather thick, often many-headed root; root collar covered with brownish remnants of dead leaves, with a small quantity of brownish tomentum in their axils. Leaves 3–10 cm long and 7–20 mm wide, scatteredly hairy or subglabrous, green, runcinately pinnatipartite with more or less deflexed, entire or subentire, short-acuminate, four to eight lateral lobes on each side, and larger terminal lobe, usually with smaller intermediate lobules between lobes. Scapes several, with lax arachnoid-hairy-tomentum below capitula. Involucre 10–15 mm long, green; outer involucre bracts lanceolately ovate to broadly lanceolate, more or less appressed to inner bracts, somewhat wider than them, with narrow scarious border, with or without small cornicles below dark apex; inner bracts oblong-linear, usually two times as long as longest outer bracts, with small or rather large subterminal cornicle, less often partly without cornicles. Florets yellow or light yellow(?), corolla scatteredly short hairy in the middle, peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body about 4 mm long with few longitudinal furrows, covered with fewer acute tubercles in the upper third or fourth; cone 0.6–0.8 mm long, well demarcated from beak; beak 4–5 mm long, pappus about 6 mm long, white. Flowering June to August.

538 Clayey and rubbly slopes of hills, gravel-beds in middle mountain zone.—*Soviet Central Asia*: Pamiro-Alai (western part). Endemic. Described from the Hissar Range. Type (southern slope of Hissar Range, Varzoba River basin, Rundasht Plateau, 2,600 m, 28.VI.1949, No. 256, G. Pissjaukova) in Leningrad.

Section 8. Parvula Hand.-Mazz. Monogr. Tarax. (1907) 45, p. p.—*Taraxacum* sect. *Rhodotricha* Hand.-Mazz. ibid. 16, p. p.—Small, less often medium, mostly mountainous plants with rather thick, usually many-headed root, flowering in June–August; root collar with rather profuse brownish tomentum in axils of leaves, less often without it. Leaves herbaceous. Scapes with more or less profuse arachnoid-hairy tomentum below capitula, less often subglabrous. Involucre bracts without cornicle, less often partly with small cornicle; outer involucre bracts few, appressed

to inner bracts, latter two to two and one-half times as long as longest outer bracts. Florets light yellow or whitish. Achenes light brown; body 2.5–3.0 mm long, with rather numerous acute tubercles in the upper part, abruptly terminating in 0.3–1.2 mm-long cone; beak 3–6 mm long, usually one and one-half times and slightly more as long as achene body.

Lectotype of section: *T. parvula* DC.

169. **T. dissectum** (Ldb.) Ldb. Fl. Ross. II (1846) 814; Hand.-Mazz. Monogr. Tarax. (1907) 47, p. p.; Kom. and Alis. Opred. Rast. Dalnevost. Kr. II, 1092; Karavaev, Konsp. Fl. Yakut. 177.—*Leontodon dissectus* Ldb. in Mém. Acad. Sc. Pétersb. V (1812) 555.—**!c.**: Hand.-Mazz. op. cit. t. 2, fig. 1.

Perennial. Plants 4–8 cm high, with rather thick, often many-headed root; root collar covered with numerous dark brownish remnants of dead leaves, with more or less profuse brownish tomentum between bases of their petioles. Leaves 2.5–8.0 cm long and 7–12 mm wide, more or less covered with long flexuous hairs, uniformly pinnatisect almost to midrib with narrow and more or less deflexed, entire lateral lobes; terminal lobe usually not larger than laterals. Scapes usually longer than leaves, more or less arachnoid pubescent, with rather profuse arachnoid-hairy tomentum below capitula. Involucre 8–11 mm long, green; outer involucral bracts broadly ovate to ovate-lanceolate, appressed to inner bracts and wider than them, with more or less wide, scarious border, without cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, also 539 without or with indistinct cornicle. Florets light yellow or whitish(?). Achenes light brown; body 2.5–3.0 mm long, with rather numerous acute tubercles in the upper half; cone about 0.8 mm long; beak 5–6 mm long pappus 4–5 mm long, whitish. Flowering June to July.

More or less steppeified meadows, alkali soils, herb slopes.—*Eastern Siberia*: Angara-Sayans, Dauria, Lena-Kolyma (southern part). Endemic. Described from Lena River. Type in Leningrad.

170. **T. collinum** DC. Prodr. VII (1838) 149, p. p.; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 102 (Fl. baic.-dah. No. 699); Schischk. in Kryl. Fl. Zap. Sib. XI 3000.—*Leontodon salinus* auct. non Poll.: Ldb. Fl. Alt. IV (1833) 153.—*L. collinus* Turcz. in Bull. Soc. Nat. Mosc. X (1837) 66, nom. nud.—*Taraxacum caucasicum* auct. non DC.: Ldb. Fl. Ross. II (1846) 813, p. p.—*T. dissectum* auct. non Ldb.: Hand.-Mazz. Monogr. Tarax. (1907) 47 p. p.

Perennial. Plants with rather thick, usually many-headed root; root collar covered with numerous dark brown remnants of dead leaves; with more or less profuse lax brownish tomentum of long flexuous hairs

between bases of their petioles. Leaves glabrous or weakly pubescent, somewhat glaucescent, 2–8 cm long and 5–12 mm wide, uniformly pinnatipartite or pinnatilobate, with more or less deflexed often entire segments or lobes, terminal lobe usually larger than lateral. Scapes one to four, as long as or longer than leaves, with more or less profuse lax arachnoid-hairy tomentum only below capitula. Involucre 9–11 mm long, green; outer involucral bracts ovate to ovate-lanceolate, appressed to inner bracts and wider than them, glaucescent, often more or less reddish in the upper part, usually with short, not always distinct, obtuse, subterminal tubercle; inner bracts oblong-linear, two times as long as longest outer bracts; more or less reddish at the apex, without or with indistinct cornicle. Florets whitish; with wide, dark (lilac) stripe on the lower side of ligule; Corolla with appressed short hairs in the middle part. Achenes brownish; body about 2.5 mm long with rather numerous longitudinal furrows, with numerous acute tubercles in the upper half; cone about 0.3–0.4 mm long; beak 4–5 mm long; pappus about 4 mm long, whitish. Flowering June to July.

Clayey slopes, alkali soils, gravel-beds and talus.—*Western Siberia*: Altai (eastern part); *Eastern Siberia*: Angara Sayans, Lena-Kolyma (southern part). Endemic. Described from Irkutsk Region. Type in Geneva; isotype in Leningrad.

Note. This species is very similar to the previous species. Possibly, it is just an ecological form with a less divided leaf blade.

171. **T. baicalense** Schischk. sp. nova in Addends XXVIII, 747.

Perennial. Plant 2–5 cm high, with rather thick, often many-headed vertical root; root collar covered with numerous dark brown remnants of dead leaves, with rather profuse brownish tomentum between petioles.

540 Leaves 2–3 cm long and 3–5 mm wide, pinnatisect almost to midrib with numerous, usually entire, acute or subobtuse lobes, covered with lax arachnoid-hairy tomentum on both surfaces (especially on petioles and along midrib). Scapes solitary or several, one and one-half times as long as leaves, covered with lax tomentum, almost all-over, especially below capitula. Involucres 7–70 mm long; outer involucral bracts about eight, ovate to lanceolate-ovate, appressed to inner bracts and somewhat wider than them, with scarious border and long flexuous hairs, without subterminal cornicle; inner bracts oblong-linear, usually two and one-half times as long as longest outer bracts, dark green, with narrow scarious border, without subterminal cornicle or with scarcely visible cornicle. Florets light yellow; peripheral florets without dark stripe on the lower side of ligule; corolla with short hairs in the middle part. Mature achenes not known; pappus about 5 mm long, white. Flowering June to July.

Dry meadows.—*Eastern Siberia*: Angara-Sayans, ?Dauria. Endemic. Described from Baikal. Type (western bank of Lake Baikal, settlement of Tagota, 21.VI.1928, No. 318, V. Sukaczhev, K. Rassadina and N. Bryzzhev) and isotype in Leningrad.

172. **T. leucanthum** (Ldb.) Ldb. Fl. Ross. II, 2 (1846) 815; Hand.-Mazz. Monogr. Tarax. (1907) 29, t. 1, fig. 8 and t. 3, fig. 3; Schischk. in Kryl. Fl. Zap. Sib. XI 2999; Karavaev, Konsp. Fl. Yakut. 177.—*Leontodon leucanthus* Ldb. Ic. pl. fl. ross. II (1830) 12 and Fl. Alt. IV (1833) 154.—*Taraxacum bicolor* DC. Prodr. VII (1838) 148, p. p.—*T. cuspidatum* Dahlst. in Acta Hort Gothoburg. II (1925–1926) 171, non Markl. (1911).—*T. asiaticum* Dahlst. ibid. 173.—**Ic.**: Ldb. op. cit. (1830) t. 132; Hand.-Mazz. op. cit.; Dahlst. op. cit. fig. 10 and 11, t. 3, fig. 5–12.

Perennial. plants with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves. Leaves 2.5–9.0 cm long and 1–9 mm wide, undivided, entire, sinuate-toothed, pinnatilobate or pinnatifid, glabrous; teeth, segments or lobes usually acute, often deflexed. Scapes almost as long as leaves or longer, glabrous or with few flexuous hairs below capitula. Involucres 7–10 mm long; outer involucral bracts ovate to ovate-lanceolate, more or less appressed to inner bracts and almost as wide, less often wider, light green, membranous, often with weak pinkish tinge, usually with wider and shorter, not always distinctly developed, subterminal cornicle; inner bracts two to two and one-half times as long as longest outer bracts, oblong-linear, herbaceous, green, with more or less developed subterminal cornicle, less often without. Florets whitish, with wide, dark (usually lilac) stripe on the outer side; corolla glabrous or with few very short hairs in the upper part of the
541 tube. Achenes light yellowish-brown; body 2.5–3.0 mm long, covered with rather numerous, acute, tubercles, in the upper half; cone 0.5–1.2 mm long; beak 3–6 mm long; pappus 4–5 mm long, with weak brownish or reddish tinge, often almost white. Flowering June to August.

Alkaline mountain meadows, salt-marshes, gravel-beds, alt. up to 3,600 m.—*Western Siberia*: Irtysh, Altai; *Eastern Siberia*: Angara-Sayans, Dauria, Lena-Kolyma (southern part); *Soviet Central Asia*: Dzhungaria-Tarbagatai, Balkhash Region (eastern part), Tien Shan (eastern part), Pamiro-Alai (eastern part). *General distribution*: Mongolia, western provinces of China. Described from Altai. Type in Leningrad.

173. **T. dealbatum** Hand.-Mazz. Monogr. Tarax. (1907) 30.—*T. bicolor* DC. Prodr. VII, 1 (1838) 148, p. p.; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3, (1848) 101, p. p. (Fl. baic.-dahur. No. 698); Karavaev, Konsp. Fl. Yakut. 177.—*Leontodon bicolor* Turcz. ex DC. op. cit. 149 in

syn.—*Taraxacum leucanthum* (Ldb.) Ldb. Fl. Ross. II, 2, (1846) 815, p. p.—**lc.**: Hand.-Mazz. op. cit. t. 1, fig. 9.

Perennial. Plants 5–20 cm high, with thicker, often many-headed root; root collar covered with rather numerous dark brown remnants of dead leaves, with more or less profuse lax brownish tomentum between bases of their petioles. Leaves numerous, 5–20 cm long and 5–35 mm wide, glabrous or subglabrous, pinnatipartite, less often pinnatilobate, with numerous, rather narrow, usually entire horizontal or somewhat deflexed lobes. Scapes almost as long as leaves, more or less covered with lax arachnoid-hairy tomentum mostly in the upper part. Involucres 10–14 mm long; outer involucre bracts ovate to ovate-lanceolate, appressed to inner bracts, as wide or slightly wider than them, light green, herbaceous-membranous, without subterminal cornicle; inner bracts oblong-linear, herbaceous, green, almost two times as long as longest outer bracts, without or with indistinct subterminal cornicles. Florets whitish or light yellow, with darker stripes on the lower side of ligules; corolla short hairy in the middle part. Achenes light brown; body about 3 mm long, with fewer acute tubercles in the upper third, cone 0.6–1.0 mm long; beak 3–6 mm long; pappus 5.5–7.0 mm long, white. Flowering July to September.

Alkali soils, alkaline meadows, gravel-beds.—*Western Siberia*: Altai (rarely); *Eastern Siberia*: Angara-Sayans, Dauria, Lena-Kolyma (southern part); *Soviet Central Asia*: ?Balkhash Region, ?Dzhungaria-Kashgaria, Tarbagatat. *General distribution*: Mongolia, Dzhungaria-Kashgaria, Tibet. Described from Trans-Baikal. Lectotype in Leningrad.

174. **T. czuense** Schischk. in Sistem. Zam. Gerb. Tomsk. Univ. 1-2 (1949) 6 and in Kryn. Fl. Zap. Sib. XI (1949) 3005.

542 Perennial. Plants with rather thick, often many-headed root; root collar covered with numerous dark brown remnants of dead leaves, with brownish tomentum not always distinct between bases of their petioles. Leaves light green with weak glaucescent tinge, glabrous or with weak arachnoid pubescence along midrib and on petioles, 6–20 cm long and 1–4 cm wide, pinnatipartite to shallow pinnatilobate, with narrow, often somewhat reflexed, entire lateral lobes, without intermediate lobules and teeth. Scapes usually longer than leaves more or less violet in lower part, with lax arachnoid tomentum below capitula, glabrous or weakly pubescent below. Involucres 11–13 mm long; involucre bracts green, more or less pinkish-violet in the upper part, without or with indistinct subterminal cornicle; outer involucre bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts and somewhat wider than them, with whitish border, membranous; inner bracts oblong-linear, two times as long as longest outer bracts, partly with wide scarious border. Florets light yellow,

peripheral florets with wide dark stripe on the lower side of ligule; corolla usually short hairy in the middle part. Achenes light yellowish-brown; body about 3 mm long, with rather narrow ribs, covered with acute tubercles almost from the base, also with very small spinules in the lower part; cone 0.4–0.6 mm long, gradually terminating in body of achenes, but well demarcated from beak; beak 3–5 mm long; pappus 6–7 mm long, whitish. Flowering July to August.

Alkaline meadows and among cheegrass stands.—*Western Siberia*: Altai; *Eastern Siberia*: Angara-Sayans, Dauria. *General distribution*: Mongolia. Described from Chuiya steppe near village of Kosh-Agach. Type and isotypes in Leningrad.

175. **T. sinicum** Kitag. in Bot. Mag. Tokyo XLVII (1933) 286.—*T. sinense* Dahlst. in Acta Horti Gothoburg. II (1926) 168, non Poir. (1816).—**lc.**: Dahlst. op. cit. fig. 9 and t. 3, fig. 1–4.

Perennial. Plants with rather thick, often many-headed root. Leaves 4–12 mm long and 6–20 mm wide, light green with more or less deflexed, entire, three to seven lateral lobes on each side, and larger terminal lobe, outer leaves in rosette often pinnatilobate or undivided, coarsely sinuate-toothed. Scapes with weak arachnoid pubescence below capitula or glabrous. Involucres 8–11 mm long, green; involucre bracts without corolla; outer involucre bracts lanceolate-ovate to broadly lanceolate, not closely appressed to inner bracts and almost as wide, with narrow scarious border, more or less pinkish in the upper part; inner bracts oblong-linear, usually two times as long as longest outer bracts, dark at the apex. Florets light yellow(?), peripheral florets with dark stripe on the lower side of ligule. Achenes light brown; body about 3 mm long, covered with acute tubercles in the upper half, with short obtuse tubercles
543 below, fairly gradually terminating in about 1 mm-long cone; beak 4.0–4.5 mm long; pappus about 5–6 mm long, whitish. Flowering July to August.

Meadows, herb slopes and gravel-beds.—*Eastern Siberia*: Angara-Sayans, Dauria. *General distribution*: China and Mongolia. Described from China. Type in Göteborg.

Note. I have not seen specimens of this species, and its systematic position is not clear to me. It is quite likely that the dimensions of the beak are given for immature achenes and thus are somewhat on the low side.

Section 9. Orientalia Hand.-Mazz. in Oesterr. Bot. Zeitschr. 6–8 (1923) 274, p. p.—Usually small alpine plants with rather thick, often many-headed root, flowering in June–August; root collar glabrous or with small quantity of brownish tomentum in leaf axil. leaves herbaceous. Scapes more or less covered with arachnoid-hairy tomentum below

capitula, less often entirely glabrous. Involucral bracts with small subterminal cornicles or entirely without them; outer bracts fewer, more or less appressed to inner bracts; inner bracts two to two and one-half times as long as longest outer bracts. Florets light yellow or yellow, less often pinkish or reddish. Achenes light brown; body 3.5–6.0 mm long with fewer, short, acute tubercles in the upper part to entirely smooth; beak somewhat thick, 0.5–5.0 mm long, almost always shorter than body achenes.

Lectotype of section: *T. crepidiforme* DC.

176. **T. crepidiforme** DC. Prodr. VII (1838) 149; Boiss. Fl. or. III, 789.—*Leontodon alpinus* Stev. in Mém. Soc. Nat. Mosc. IV (1812–1813) 100; MB. Fl. taur.-cauc. III (1819) 531, non Hoppe (1821).—*L. stevenii* Spreng. Syst. veg. III (1896) 658, nom. superfl.—*Taraxacum stevenii* (Spreng.) DC. op. cit. 149, p. p.; Hand.-Mazz. Monogr. Tarax. (1907) 52; Schischk. in Grossh. Fl. Kavk. IV (1934) 248; Grossh. Opred. Rast. Kavk. 513; Kapeller in Fl. Gruzii, VIII, 664; Sofieva in Fl. Azerb. VIII, 539.—*T. integrifolium* C. Koch in Linnaea, XXIII (1850) 676; Boiss. op. cit. 789.—**lc.**: Hand.-Mazz. op. cit. t. 2, fig. 4 and t. 4, fig. 9.

Perennial. plants 5–20 cm high, with rather thick, ascending or vertical root; root collar covered with fewer dark brown remnants of dead leaves, glabrous. Leaves green, glabrous, 2–15 cm long and 3–25 mm wide, usually undivided and entire, or with remote teeth, less often with more or less distinct short lobes. Scapes slender, as long as leaves or slightly longer than them, usually entirely glabrous, less often with very weak arachnoid pubescence below capitula. Involucre 10–16 mm long; involucral bracts dark green, often blackish, herbaceous, without cornicle, less often
544 with indistinct cornicle; outer bracts broadly lanceolate to lanceolate, more or less appressed to inner, almost as wide or slightly wider than them, with more or less developed scarious border, inner bracts oblong-linear, two times as long as longest outer bracts. Florets light yellow, peripheral florets usually with wide dark stripe on the outer side of ligule; corolla glabrous. Achenes light brown; body 3.5–5.0 mm long with shorter and coalescing acute tubercles, in the upper third; tubercles sometimes almost absent; body gradually terminating into cone, which in turn indistinctly terminating in thick, 2–5 mm-long beak; pappus 5–7 mm long, white. Flowering July to August. (Plate XXV, Fig. 2).

Alpine and subalpine meadows, stony slopes.—*Caucasus*: Ciscaucasia, Dagestan, Eastern, Western and Southern Transcaucasia. *General distribution*: Armenia and Kurdistan, Iran. Described from Iran. Type in Geneva.

177. **T. heptapotamicum** Schisch. sp. nova in Addenda XXVIII, 748.

Perennial. Plant 2–8 cm high, with thick, usually many-headed root; root collar covered with dark brown remnants of dead leaves, glabrous or subglabrous. Leaves glabrous, glaucescent-green, somewhat thick, 3–8 cm long and 5–15 mm wide, undivided, more or less sinuate-toothed to entire. Scapes one to four, almost as long as leaves, with rather profuse lax tomentum below capitula. Involucres 10–12 mm long; involucre bracts dark green, herbaceous, dorsally usually scatteredly hairy on the outer side, with very short dark subterminal cornicle or entirely without; outer bracts ovate to lanceolate-ovate, appressed to inner, almost as wide or wider than them, with wide scarious border; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts. Florets whitish or light yellow(?), slightly pinkish when dry, with few short hairs in the middle part of corolla. Achenes brownish; body about 4.5 mm long, almost smooth, with scarcely noticeable tubercles in the upper part, gradually terminating in about 0.8–1.0 mm-long cone, which in turn rather gradually terminates in somewhat thick, 3–4 mm-long beak; pappus about 5 mm long, whitish. Flowering June to July.

Clayey slopes, alkaline grassy patches, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Tien Shan (eastern part). Endemic. Described from Tersk Alatau Range. Type (Tersk Alatau Range, near Tien Shan Observatory, 3.VII.1941, V. Goloskokov) in Leningrad.

178. **T. goloskokovii** Schischk. sp. nova in Addenda XXVIII, 748.

545 Perennial. Plants 5–10 cm high, with ascending or vertical, often many-headed root; root collar covered with brownish remnants of dead leaves, glabrous. Leaves glabrous, on rather long petioles, 3–7 cm long including petioles and 2–8 mm wide, from undivided, and entire to pinnatifid with more or less reflexed, usually unequal, lateral lobes. Scapes entirely glabrous. Involucres 8–12 mm long, somewhat glaucescent-green; outer involucre bracts lanceolate-ovate to lanceolate, appressed to inner bracts, almost as wide or wider than them, with whitish border, membranous, without or with small subterminal cornicle, not always well developed; inner bracts oblong-linear, two times as long as longest outer bracts, usually with small, dark, subterminal cornicle. Florets light yellow or whitish; peripheral florets with wide dark stripes on the lower side of ligule. Achenes light brown; body 4–5 mm long, smooth or scarcely tuberculate in the upper part, gradually attenuate above (without distinct cone) and terminating in short thick, 1–2 mm-long beak, breaking at weakly developed articulation; pappus about 5 mm long, white. Flowering July to August.

Clayey and stony slopes in upper mountain zone.—*Soviet Central Asia*: Dzhungaria-Tarbagatai. Endemic. Described from Dzhungarian Alatau. Type (Dzhungarian Altai, Koksu River Basin, headwaters

of Korzhun River, 24.VIII.1924, V. Goloskokov) and isotype in Leningrad.

179. **T. tzvelevii** Schischk. sp. nova in Addenda XXVIII, 749.

Perennial. Plant 1.5–6.0 cm high, with rather thick, often many-headed root; root collar covered with numerous black-brown remnants of dead leaves, glabrous or subglabrous. Leaves 2–5 cm long, 3–9 mm wide, glabrous, somewhat glaucescent-green, undivided and entire or remote sinuate-toothed. Scapes more or less arachnoid-hairy tomentose in the upper part, especially below capitula. Involucres 10–13 mm long; outer involucral bracts broadly ovate to lanceolate-ovate, more or less appressed to inner bracts and wider than them, light green, with wide scarious border with or without short, dark, subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with short subterminal cornicle not always distinct. Florets yellow with glabrous corolla; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light yellowish-brown; body 3.5–4.0 mm long, with rather numerous longitudinal furrows, with fewer acute tubercles in the upper third, gradually terminating in about 0.4 mm-long cone; beak 2.5–3.5 mm long. Pappus about 5 mm long, often with brownish tinge. Flowering July to August.

Grassy patches and gravel-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (eastern part). Endemic. Described from Pamir. 546 Type (mountainous Badakhshan Autonomous Region, Bilyand-Kiik, River basin, at mouth of left tributary of Bilyand-Kiik, 6 km north of Takhtakorum Pass, 1.VIII.1958, No. 1025, N. Tzvelev) in Leningrad.

180. **T. pojarkoviae** Schischk. sp. nova in Addenda, XXVIII, 749.

Perennial. Plants 3–10 cm high, with thick, usually many-headed root; root collar glabrous. Leaves 2–10 cm long and 3–10 mm wide, numerous, glabrous, glaucescent-green, from undivided, more or less toothed (sometimes partly entire) to pinnatifid, with more or less deflexed, entire, three to six lateral lobes on each side, and larger terminal lobe. Scapes usually ascending, rather numerous with lax arachnoid tomentum below capitula. Involucres 10–13 mm long, outer involucral bracts oblong-ovate to oblong-lanceolate, more or less appressed to inner bracts and slightly wider than them, scarious, light green with wide border, often more or less toothed, without or with very short, obtuse, cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, dark green, with or without small, obtuse, subterminal cornicles. Florets light yellow, peripheral florets with wide dark stripe on lower side of ligule; with few very short hairs in the middle part of corolla. Achenes light brown; body 3.5–4.0 mm long, with rather numerous but weakly developed longitudinal

furrows, covered with acute tubercles in the upper fourth and along two main ribs almost to the base; cone 0.6–1.0 mm long; beak somewhat thick, 2.0–3.5 mm long; pappus 6–7 mm long, white, sometimes with brownish tinge. Flowering July to August. (Plate XXVI, Fig. 2).

Salt marshes, saline meadows, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (eastern part). Endemic. Described from Lake Kara-Kul. Type (Trans-Alai Range, near Lake Kara-Kul, 23.VIII.1954, No. 605, P. Poljakov) and isotype in Leningrad.

181. **T. glabellum** Schischk. sp. nova in Addenda XXVIII, 750.

Perennial. Plants with rather thick, often many-headed root; root collar covered with numerous black-brown remnants of dead leaves, with, not always conspicuous, lax tomentum of long flexuous hairs in axils of their petioles. Leaves glabrous, slightly glaucescent, 2–5 cm long and 5–15 mm wide, from undivided more or less toothed to pinnatifid with somewhat deflexed, often more or less toothed, lateral lobes. Scapes one to five, almost as long as leaves, glabrous or with weak arachnoid pubescence. Involucres 8–11 mm long, rather narrow; outer involucral bracts oblong-ovate to lanceolate, more or less deflected from inner bracts (to recurved), almost as wide as inner, usually glaucescent-green, without or with inconspicuous, short, subterminal cornicle; inner bracts oblong-
547 linear, two to two and one-half times as long as longest outer bracts, without or with very short, dark, subterminal cornicle. Florets light yellow, peripheral florets with dark wide stripe on the lower side of ligules; corolla short hairy in the middle part. Achenes light brown; body 3.5–4.0 mm long, with shorter, fewer, acute tubercles in the upper fourth; cone 0.7–0.8 mm long, gradually terminating in 3–4 mm-long beak; pappus 3.5 mm long, white. Flowering July.

Stony and loamy slopes of upper mountain zone.—*Soviet Central Asia*: Tien Shan (Karatau). Endemic. Described from Karatau Range. Type (Mindzhilke Mountain, 9.VII.1936, No. 196, G. Mikeshin) in Leningrad.

182. **T. brevirostre** Hand.-Mazz. Monogr. Tarax. (1907) 46, p. p.; Kovalevskaya in Fl. Uzb. VI, 460.—*T. bithynicum* auct. non. DC.: Ldb. Fl. Ross. II (1846) 817, p. p.—*Id.*: Hand.-Mazz. op. cit. t. 1, fig. 18.

Perennial. Plants with rather thick, often many-headed root; root collar covered with brownish remnants of dead leaves, glabrous. Leaves glabrous or subglabrous, less often more or less covered with thin arachnoid-hairy tomentum, 3–12 cm long and 0.4–2.0 cm wide, pinnatifid or pinnatilobate, with rather narrow, horizontal or somewhat deflexed entire lobes or undivided, more or less sinuate-toothed to subentire. Scapes usually fewer, slender, almost as long as leaves at flowering time, more

or less covered with lax arachnoid tomentum below capitula to subglabrous. Involucre 8–14 mm long, green; outer involucre bracts lanceolate-ovate to lanceolate, appressed to inner bracts and slightly wider than them, scarious, with short, not always developed subterminal cornicles; inner bracts oblong-linear, two times as long as longest outer bracts, with short dark terminal cornicle. Florets light yellow, with wide dark stripe on the lower side of ligule; corolla with occasional very short hairs in the middle or glabrous. Achenes light brownish-gray; body 4–5 mm long, with fewer obtuse or subacute tubercles in the upper third; cone 0.6–0.8 mm long; beak somewhat thick, 2.0–3.5 mm long; pappus 5–6 mm long, white. Flowering June to July.

Clayey slopes and grassy patches in alpine zone.—*Soviet Central Asia*: Tien Shan (western part), Pamiro-Alai. *General distribution*: Iran-Afghanistan, Indo-Himalayas. Described from Pamir. Type in London.

Note. A highly polymorphic species, apparently segregating into several, still inadequately studied, ecogeographic races.

183. ***T. pseudominutilobum*** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, XVII (1962) 7 and in Fl. Uzb. VI, 459.

548 Perennial. Plants 2–8 cm high, with rather thick, often many-headed root; root collar subglabrous. Leaves 4–7 cm long and 4–12 mm wide, glabrous or subglabrous, green, outer leaves of rosettes almost undivided or with one or two pairs of small lateral lobes and larger, lanceolate, terminal lobe, more inner leaves pinnatipartite with rather numerous, narrow, horizontal or somewhat deflexed lateral lobes and rather large linear terminal lobe, less often all leaves in rosette either pinnatipartite or undivided, more or less toothed or even entire. Scapes covered with lax arachnoid-hairy tomentum below capitula. Involucre 8–12 mm long; outer involucre bracts lanceolate to linear-lanceolate, more or less appressed to inner bracts and slightly narrower than them, slightly arachnoid pubescent or glabrous, with very narrow, scarious border, with small, dark, subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, with pinkish scarious border, with small subterminal cornicle. Florets yellow; corolla sparsely hairy in the middle, peripheral florets with dark stripe on the lower side of ligule. Achenes light brown; body 4.5–5.5 mm long with few longitudinal furrows, with few, usually only barely visible, acute or subobtuse tubercles in the upper half, gradually and imperceptibly terminating in short cone; beak 1–2 mm-long, somewhat thick; pappus 4–5 mm long, often with brownish or yellowish tinge. Flowering July to September.

Grassy patches, stony and rubbly slopes in upper mountain zone.—*Soviet Central Asia*: Tien Shan (western part). Endemic. Described

from western Tien Shan (upper reaches of Angren River). Type in Tashkent.

184. **T. minutilobum** M. Pop. ex S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, SVII (1962) 6 and in Fl. Uzb. VI, 458; M. Popov in Tr. Uzb. Gos. Univ. Nov. Ser. Biol. XIV (1941) 98, diagn. in Russ.

Perennial. Plants 2–8 cm high, with rather thick, usually many-headed root. Leaves 3–8 cm long and 4–10 mm broad, grayish due to profuse arachnoid-hairy tomentum, less often (outer leaves of rosette) less pubescent, pinnatisect with narrow and small, often, entire, three to six lateral lobes on each side, much smaller intermediate lobules (often entirely absent), and small usually lanceolate, terminal lobe. Scapes several, more or less covered with lax arachnoid-hairy tomentum, more profusely tomentose below capitula. Involucres 10–13 mm long, narrower, more or less covered with arachnoid-hairy tomentum; outer involucral bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts, somewhat wider than them, with wider scarious border, almost all bracts with small, dark, subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, fewer (usually eight), also with small blackish subterminal cornicle. Florets yellow, somewhat pinkish when dry, corolla subglabrous or glabrous; peripheral florets with wide dark stripe on the lower side of ligule. Achenes brownish-gray, body 4.5–6.0 mm long, with a few longitudinal furrows, entirely smooth, less often with scarcely noticeable tubercles in the upper part, gradually and indistinctly terminating in short cone; beak somewhat thick, about 0.4–0.6 mm long; pappus 4–5 mm long, whitish, usually with brownish tinge. Flowering July to August.

Rubby and stony slopes, talus and gravel-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (western part). Endemic. Described from Zeravshan River basin (near Lake Mura). Type in Tashkent.

185. **T. erostre** Zak. in Kovalevskaya in Fl. Uzb. VI (1962) 458 and 516 (Appendix); Zakir. in Tr. Uzb. Gos. Univ. Nov. Ser. 89, Bot. (1957) 164, Nom. nud.—*T. brevirostre* Hand.-Mazz. Monogr. Tarax. (1907) 46, p. p.

Perennial. Plants with rather thick, many-headed root; root collar covered with brownish remnants of dead leaves, with lax tomentum of long flexuous hairs not always noticeable between bases of their petioles. Leaves scatteredly arachnoid-hairy or glabrous, 4–7 cm long and 5–15 mm wide, lyrate pinnatifid with a few, entire, lateral lobes and much larger terminal lobe, outer leaves of rosette often undivided, sinuate-

toothed. Scapes almost as long as leaves at flowering time, more or less arachnoid hairy with lax arachnoid tomentum below capitula. Involucres 10–12 mm long; outer involucral bracts dark green, with rather wide scarious border, broadly ovate to broadly lanceolate, with small dark subterminal cornicle, appressed to inner bracts and slightly wider than them; inner involucral bracts oblongly linear, two and one-half times as long as longest outer bracts, also with small subterminal cornicle. Florets light yellow; peripheral florets often pinkish in dry state; corolla glabrous or subglabrous. Achenes light brown; body 4.5–5.5 mm long, with few longitudinal furrows, with few, very short, acute tubercles in the upper third or fourth, gradually terminating in 0.8–1.0 mm-long cone; well separated from beak; beak somewhat thick, 0.8–1.5 mm long; pappus 0.4–5.5 mm long, white. Flowering July to August.

Stony slopes, rocks in upper mountain zone.—*Soviet Central Asia: Pamiro-Alai* (western part). Endemic. Described from Zeravshan Range. Type in Tashkent.

186. **T. rubidum** Schischk. sp. nova in Addenda XXVIII, 750.

550 Perennial. Plants 1.5–4.0 cm high, with rather thick, usually many-headed root; root collar with numerous brownish remnants of dead leaves, glabrous. Leaves 1.5–4.0 cm long, glabrous, glaucescent-green, with long narrowly winged petioles, usually lyrate-pinnatifid with horizontal or more or less deflexed, entire, three to five lateral lobes on each side and much larger, also entire, terminal lobe. Scapes with profuse lax arachnoid-hairy tomentum below capitula. Involucres 8–10 mm long, glaucescent-green; outer involucral bracts lanceolate-ovate to broadly lanceolate, appressed to inner bracts, and slightly narrower than them, with rather wider scarious border, without cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, without cornicle. Florets pink or reddish; peripheral florets with wide dark stripe on the lower side of ligule. Achenes light yellowish-brown; body 4.5–5.0 mm long, with few shorter spinules in the upper part, very gradually and indistinctly terminating in 0.8–1.0 mm-long cone; beak in immature achene 0.6–1.0 mm long, later possibly elongating to 2–3 mm; pappus about 5 mm long white. Flowering July to August. (Plate XXVI, Fig. 3).

Gravel-beds, stony and rubbly slopes in upper mountain zone.—*Soviet Central Asia: Pamiro-Alai* (eastern part). Endemic. Described from the northwestern Pamir. Type (mountainous Badakhshan Autonomous Region, Bilyand-Kiik River basin, at mouth of its tributary, 7 km north of Takhhta-Korum Pass, 2.VIII.1958, No. 1067, N. Tzvelev) in Leningrad.

187. **T. lyratum** (Ldb.) DC. Prodr. II (1838) 148; Ldb. Fl. Ross. II,

816; Hand.-Mazz. Monogr. Tarax. (1907) 57; Schischk. in Kryl. Fl. Zap. Sib. XI, 3001.—*Leontodon lyratus* Ldb. Fl. Alt. IV (1833) 152 and Ic. pl. fl. Ross. V. (1834) 27.—**Ic.**: Ldb. op. cit. (1834) t. 497.

Perennial. Plants 2–8 cm high, with more slender, sometimes many-headed root; root collar with fewer remnants of dead leaves, glabrous or with few long flexuous hairs. Leaves 3–8 cm long and 5–17 mm wide, with long (often as long as lamina), narrow-winged petioles, glabrous or subglabrous, lyrate pinnatifid, with a few (usually one to four on each side), entire, more or less deflexed lateral lobes and much larger terminal lobe. Scapes with more or less profuse lax arachnoid-hairy tomentum below capitula. Involucres 8–12 mm long; outer involucral bracts lanceolate-ovate to lanceolate, more or less appressed to inner bracts, almost as wide or slightly wider than them, green, usually with small, dark, subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, green, without or with small, dark subterminal cornicle. Florets light yellow or yellow(?) with glabrous
551 or subglabrous, almost monochromatic corolla. Achenes light yellowish-brown; body 4.5–5.0 mm long, with a few longitudinal furrows, covered with very short (usually scarcely visible) and sparse, acute tubercle in the upper third, gradually and indistinctly terminating in about 0.4 mm-long cone, well separated from the beak; beak 2.5–3.5 mm long, somewhat thick; pappus 6–7 mm long, white. Flowering July to August.

Dry stony and rubbly slopes, gravel-beds in upper mountain zone.—*Western Siberia*: Altai. Endemic. Described from Altai (Chuya River basin). Type and isotypes in Leningrad.

188. **T. aksaicum** Schischk. in Sistem. Zam. Gerb. Tomsk. Univ. 1–2 (1949) 7 and in Kryl. Fl. Zap. Sib. XI (1949) 3005.

Perennial. Plants thicker (0.5–1.0 cm thick in upper part), many-headed root; root collar covered with brownish remnants of dead leaves. Leaves numerous, linear-oblong, 5–12 cm long and 0.7–1.5 cm wide, deeply (but not to midrib) pinnatifid, with oblong or lanceolate, deflexed, subobtusely or acute lobes, glabrous or weakly pubescent with short crisped hairs. Scapes rather numerous (to 15), slightly longer than leaves, covered with lax arachnoid-hairy tomentum in the upper part or almost entirely. Involucres about 10 mm long; outer involucral bracts appressed to inner, as wide as latter, and likewise membranous, light green, ovate to broadly lanceolate, apically attenuate, with indistinct cornicle; inner involucral bracts to times as long as longest outer bracts, oblong-linear, green, with narrow scarious border, with rather well-developed cornicles below dark apex. Florets whitish, peripheral with wide, lilac stripe on the lower side. Achenes light yellowish-brown, ribbed; body 3.5–4.5 mm long, with fewer acute tubercles in the upper third or fourth;

cone about 0.5 mm long; beak somewhat thick, 2–3 mm long; pappus 4–5 mm long, white. Flowering August.

Alkaline meadows, gravel-beds at 1,500–2,000 m.—*Western Siberia*: Altai. *General distribution*: Mongolia (western part). Described from Aksai River, near its emergence in Chuya Steppe. Type in Tomsk; isotype in Leningrad.

SPECIES OF UNCERTAIN AFFINITY

189. **T. alaicum** Schischk. sp. nova in Addenda XXVIII, 751.

Perennial. Plants with thicker, vertical or oblique ascending root; root collar densely covered with dark brown remnants of dead leaves. Leaves numerous, 5–12 cm long and 1.7–2.0 cm wide, glabrous, deeply (but not to midrib) pinnatisect; terminal lobe larger, acute; lateral lobes remote, lanceolate, acute, usually entire, horizontal or somewhat deflexed. Scapes two to four, almost as long as leaves, more or less covered with lax arachnoid-hairy tomentum below capitula. Involucres 10–12 mm long; outer involucral bracts appressed to inner, wider than them, broadly ovate to lanceolate-ovate, light green, membranous, cornicle; inner bracts almost two times as long as longest outer bracts, oblong-linear, with indistinct subterminal cornicle. Florets whitish; peripheral florets with wide lilac stripe on the lower side. Achenes light brownish-yellow, ribbed, body 3.5–4.5 mm long, with fewer acute tubercles in the upper third, only with very fine spinules on ribs below; cone 0.5–0.8 mm long; beak rather slender, 4–6 mm long; pappus about 5 mm long, white. Flowering July to August.

Stony slopes and gravel-beds in alpine zone.—*Soviet Central Asia*: Pamiro-Alai (Alai Range, northeastern Pamir). Endemic. Described from Alai Range. Type (Alai Range, Sary-Tash, bank of tributary of Surkhob River, 22.VII.1930, No. 807, S. Juzepczuk) in Leningrad.

190. **T. albescens** Dahlst. in Arkiv för Botanik XX A, 1 (1925) 14; Hult. in Kungl. Sv. Vet. Akad. Handl. ser. 3, VIII, 2 (1930) 221; Kom. Fl. Kamch. III (1930) 192.—*lc.*: Dahlst. op. cit. fig. 9.

Perennial. Plants 2.5–8.0 mm [sic., recte cm] high with rather thick, often many-headed root; root collar glabrous. Leaves 2–5 cm long, 6–12 mm wide, glabrous, narrowed at base with rather long, broad-winged petiole, usually pinnatilobate with entire, horizontal or deflexed, three to five lateral lobes on each side and small terminal lobe, widest in the middle part of lamina. Scapes with lax arachnoid tomentum below capitula. Involucres 12–15 mm long at anthesis, dark green; outer involucral bracts lanceolately ovate to broadly lanceolate, more or less appressed to inner

bracts and slightly wider than them, with wider scarious border, without or with very indistinct short cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, without or with indistinct cornicle. Florets whitish; peripheral florets with wide dark stripe on the lower side of ligule. Mature achenes not known. Flowering July to August.

Grassy patches, stony slopes in upper mountain zone.—*Far East*: Kamchatka. Endemic. Described from Kamchatka (Ganal "Vostryaki"*). Type in Stockholm; isotype in Leningrad.

Note. So far this species is known only from the type specimens, which lack mature achenes; consequently its systematic position is not clear.

- 553 191. **T. calcareum** V. Korol. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, VIII, 6 (1940) 92.—**lc.**: V. Koroleva, *ibid.* Fig. 1.

Perennial. Plants with rather thick, often many-headed root. Leaves dark green, pinnatilobate or pinnatipartite, usually with intermediate teeth and lobules, lateral lobes narrow and long-acuminate, slightly deflexed. Scapes rather numerous, slender, almost as long as leaves. Involucres dark green, 10–14 mm long; outer bracts 10–12, ovate to broadly lanceolate, appressed to inner bracts and slightly wider than them, with very short, often indistinct subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, with or without indistinct subterminal cornicle. Florets whitish, with wide darker stripe on the lower side of ligule. Achenes light brown; body 5.0–5.5 mm long, with numerous acute tubercles in the upper half, only with short obtuse tubercles below; cone 1.2–1.4 mm long; beak 3.5–4.0 mm long; pappus 5–6 mm long, usually with grayish or brownish tinge. Flowering July.

Stony (mostly limestone) slopes, gravel-beds.—*Soviet Central Asia*: Tien Shan (eastern part). Endemic(?). Described from specimens grown at plantation of experimental station of the All-Union Institute of Plant Industry in Leningrad Region ("Krasnyi Pakhar") along with "kok-saghyz" and originating in Central Tien Shan. Type in Leningrad (Herbarium of the All-Union Institute of Plant Industry).

192. **T. eriobasis** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk. UzbSSR, XVII (1962) 10 and in Fl. Uzb. VI, 465.

Perennial. Root collar with more or less profuse lax brownish tomentum of long flexuous hairs between bases of petioles of living and dead leaves. Leaves herbaceous, glaucescent-green, with occasional flexuous hairs only along midrib, 5–13 cm long and 1–2 cm wide,

*Rapidly flowing streams—General Editor.

pinnatisect with rather numerous lateral lobes slightly deflexed at the base, and with irregularly toothed upper margin, terminal lobe narrow-deltoid, slightly larger. Scapes shorter than leaves at anthesis, covered with lax arachnoid tomentum mostly below capitula. Involucres smaller; involucre bracts herbaceous; outer bracts oblong-ovate, erect but more or less deflected from inner bracts, with wide, scarious border, with blackish longitudinal stripe on the outer side, with black larger subterminal cornicle; inner bracts oblong-linear, two times as long as longest outer bracts, glaucescent-green, with dark subterminal cornicle. Florets light yellow, peripheral with dark stripe on the lower side of ligule; corolla glabrous or subglabrous. Achenes (immature) light brown; body about 5 mm long, 554 with acute tubercles at the apex; cone about 1.2 mm long; beak about 7 mm long; pappus about 5 mm long, white. Flowering May.

Roadsides, plantations of agricultural crops.—*Soviet Central Asia*: Syr-Darya. Endemic. Described from Tashkent. Type in Tashkent.

Note. I did not see specimens of this species, and its systematic position is not entirely clear to me. Possibly, the dimensions of the beak given are those of immature achenes.

193. **T. gnezdilloi** S. Koval. in Bot. Mat. Gerb. Inst. Bot. Akad. Nauk UzbSSR, SVII (1962) 7 and in Fl. Uzb. VI, 459.

Perennial. Plants with rather thick root; root collar covered with dark brown remnants of dead leaves, glabrous or subglabrous. Leaves glabrous or subglabrous, 15–25 cm long and 1.5–3.5 cm wide, pinnatipartite, with more or less deflexed, few, remote lateral lobes, and much larger, broadly lanceolate terminal lobe. Scapes more or less covered with lax arachnoid tomentum below capitula. Involucres 14–16 mm long; involucre bracts dark green, with scarious border, often pinkish at the apex, with fairly large, blackish, subterminal cornicle; outer bracts membranous, ovate to lanceolate-ovate, more or less appressed to inner bracts and slightly wider than them; inner bracts oblong-linear, two times as long as longest outer bracts, herbaceous. Florets light yellow or whitish(?), corolla glabrous, with wide dark stripe on the lower side of ligule. Achenes light brown; body about 4 mm long, covered with acute tubercles in the upper third; cone about 0.8 mm long; beak 2.5–3.0 mm long in immature achenes, later possibly becoming longer; pappus 5–6 mm long. Flowering June to August.

Stony slopes and rocks in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (Kugitang). Endemic. Described from Kugitang Range. Type in Tashkent; isotype in Leningrad.

194. **T. linczevskyi** Schischk. sp. nova in Addenda XXVIII, 751.

Perennial. Plants 5–15 cm high with thick, usually many-headed root;

root collar covered with numerous blackish-brownish remnants of dead leaves, glabrous. Leaves 5–12 cm long and 8–16 mm wide, glabrous or subglabrous, usually pinnatilobate, with more or less deflexed lateral lobes and relatively small terminal lobe, less often undivided, sinuate-toothed or shallow pinnatipartite. Scapes initially entirely arachnoid-hairy, later more or less glabrescent but always with profuse lax arachnoid tomentum below capitula. Involucre 10–14 mm long at flowering time, dark green; involucre bracts with short obtuse subterminal cornicle or (usually only partly) entirely without; outer bracts broadly lanceolate to lanceolate, more or less appressed to inner bracts at flowering time and almost as wide, later more or less separated, with narrow, scarious border; inner bracts oblong-linear, one and one-half times as long as longest outer bracts. Florets yellow, corolla more or less hairy from long and short hairs; peripheral florets with wide dark stripe on the lower side of ligule. Achenes (immature) light yellowish-brown; body 2.5–3.0 mm long, with fewer, short, acute tubercles in the upper third or fourth; cone 0.5–0.7 mm long; beak 3–4 mm long; pappus about 6 mm long, white, Flowering June to July.

Alpine, "saz"*-type, short-grass meadows in upper mountain zone.—*Soviet Central Asia*: Tien Shan (western part). Endemic. Described from Talass Alatau. Type (Talass Alatau, Dzhebogly Mountains, Ulkun-Kaindy Pass, 6.VII.1933, No. 313, I. Linczevsky) and isotypes in Leningrad.

195. *T. litwinowii* Schischk. in Grossh. Fl. Kavk. IV (1934) 250; Grossh. Opred. Rast. Kavk. (1949) 513; Kapeller in Fl. Gruzii, VIII, 665; Addenda XXVIII, 752.

Perennial. Plants 5–15 cm high, with rather thick root; root collar covered with dark brown remnants of dead leaves, glabrous. Leaves 3–9 cm long and 7–14 mm wide, glabrous, somewhat thickish, undivided, small-toothed to entire. Scapes glabrous. Involucres 10–14 mm long; involucre bracts without cornicle or with indistinct cornicle; outer bracts ovate-lanceolate to lanceolate, more or less appressed to inner bracts and usually wider than them, membranous, light green, often with wide scarious border; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts, green or dark green, herbaceous. Florets light yellow, peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown; body 4.0–4.5 mm long, with fewer longitudinal furrows, covered with acute spinules in the upper third, rather

* Saz—habitat with high and permanent water table in arid regions of Soviet Central Asia—General Editor.

gradually terminating in 0.4–0.6 mm-long cone, not very clearly separated from beak; beak 6–8 mm long; pappus 4–5 mm long, white, Flowering July.

Stony and clayey slopes in upper mountain zone.—*Caucasus*: Western Transcaucasia (southern part), southern Transcaucasia (western part?). *General distribution*: Armenia and Kurdistan. Described from northeastern Turkey. Lectotype (former Kars Region, Surb-Khach Mountain, 16.VII.1914, D. Litwinow) in Leningrad.

196. **T. luridum** Hagl. in Bot. Notis. (1938) 307.—*lc.*: Hagl. *ibid.* fig. 5.

Perennial. Plants 5–15 cm high with rather thick, often many-headed root; root collar sparsely hairy. Leaves 3–8 cm long and 5–20 mm wide, grayish-green, subglabrous, outer leaves in rosette often undivided, sinuate-toothed, others pinnatilobate to pinnatipartite with rather narrow and usually entire, five to nine lateral lobes of unequal size on each side and 556 small terminal lobe. Scapes more or less arachnoid pubescent below capitula. Involucres 9–10 mm long, green; outer involucre bracts lanceolate-ovate to broadly lanceolate, appressed to inner bracts and slightly wider than them, light green, with narrow, scarious border, more or less pinkish at the apex, with small, obtuse, dark subterminal cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, usually with very small, not always distinctly developed subterminal cornicle. Florets light yellow or whitish(?), peripheral florets with wide dark stripe on the lower side of ligule. Achenes light brown body about 4 mm long, covered with rather long, acute tubercles in the upper part, only with short obtuse tubercles below; cone about 0.7 mm long; beak 5–6 mm long; pappus whitish, 5–6 mm long. Flowering June to July.

Grassy patches, gravel-beds, clayey and stony slopes in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (eastern part). *General distribution*: Dzhungaria-Kashgaria (southern part). Described from western China (Kashgaria). Type in Stockholm.

197. **T. muricatum** Schischk. in Fl. Turkm. VII (1960) 319 and 383.

Perennial. Plant 3–8 cm high, with rather thick, usually many-headed root; root collar covered with dark brown remnants of dead leaves, with more or less profuse brownish tomentum of long flexuous hairs in their axils. Leaves 3–7 cm long and 5–12 mm wide, more or less scattered hairy to subglabrous, pinnatipartite with wider, more or less deflexed lateral lobes, entire or more or less toothed on the anterior margin, and smaller terminal lobe. Scapes with rather profuse, lax arachnoid-hairy tomentum below capitula. Involucres 8–11 mm long, green; outer involucre bracts

ovate to broadly-lanceolate more or less appressed to inner bracts, almost as wide or slightly wider than inner, with scarious border, often more or less pinkish above, without cornicle; inner bracts oblong-linear, two to two and one-half times as long as longest outer bracts, without or with indistinct cornicle. Florets light yellow, corolla short hairy in the middle part, with wide dark stripe on the lower side of ligule. Achenes light brown; body 4.5–5.0 mm long, with scattered, acute, tubercles (in the upper part of achenes longer), and very fine spinules almost from the base, with rather numerous longitudinal furrows, gradually terminating in 0.6–0.8 mm-long cone; beak 2.5–3.5 mm long, somewhat thick, pappus about 5 mm long, whitish. Flowering June to July.

- 557 Stony and clayey slopes of upper mountain zone.—*Soviet Central Asia*: mountainous Turkmenia. Endemic. Described from Kopetdag. Type and isotype in Leningrad.

198. **T. oschense** Schischk. sp. nova in Addenda XXVIII, 752.

Perennial. Plants with rather thick, often many-headed root; root collar covered with dark brown remnants of dead leaves, with more or less profuse, lax tomentum in their axils. Leaves 2.5–6.0 cm long and 2–8 mm wide, glaucescent-green, glabrous, subacute; outer leaves in rosette usually undivided, and entire with distinct teeth, inner more or less toothed to shallow pinnatilobate, with fewer (two or three on each side), more or less deflexed, entire, lateral lobes. Scapes covered with lax arachnoid-hairy tomentum below capitula, scatteredly arachnoid pubescent to subglabrous below. Involucres 7–12 mm long; outer involucral bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts and slightly wider than them, membranous, light green with wide scarious border, with larger often subacute subterminal cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, with small, dark, subterminal cornicle. Florets light yellow(?); corolla subglabrous; peripheral florets with wide dark stripes on the lower side of ligule. Achenes light yellowish-brown; body about 2.5 mm long with rather numerous longitudinal furrows, covered with fewer, acute, tubercles in the upper third, only with very small spinules below; cone about 0.5 mm long; beak 1.5–2.5 mm long; pappus 3.5–4.0 mm long, usually with brownish tinge. Flowering June to July.

Sands and gravel-beds, in river valleys and gorges in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (Alai and Trans-Alai ranges). Endemic. Described from Alai Valley. Type (former Osh District, Alai Valley, near crossing on Kyzyl-su River, 1.VII.1913, No. 702 O. Knorring) in Leningrad.

199. **T. pamiricum** Schischk. sp. nova in Addenda XXVIII, 753.

Perennial. Plants 2–10 cm high with rather thick, often many-headed root; root collar covered with rather numerous remnants of dead leaves, more or less hairy in their axils. Leaves 2–5 cm long and 3–9 mm wide, glabrous, usually undivided, sinuate-toothed, with fewer (two to four on each side) teeth, less often subentire or pinnatilobate. Scapes covered with
 558 arachnoid pubescent, later glabrescent. Involucres 8–12 mm long; outer involucral bracts lanceolate-ovate to broadly lanceolate, more or less appressed to inner bracts and slightly wider than them, dark green, with wide, scarious border, without or with indistinct cornicle; inner bracts oblong-linear, usually two times as long as longest outer bracts, also dark green, with or without small, dark, subterminal cornicle. Florets yellow, corolla glabrous or subglabrous; peripheral florets with dark stripe on the lower side of ligule. Achenes brownish; body about 5 mm long, with a few very short tubercles in the upper part, almost smooth, gradually terminating in about 0.5 mm-long cone; beak 4–5 mm long; pappus white, 4–5 mm long. Flowering June to August.

Grassy patches, gravel-beds in upper mountain zone.—*Soviet Central Asia*: Pamiro-Alai (eastern part). Endemic. Described from Pamir. Type (eastern Pamir, Chechektinka River basin, about 4,760 m, K. Stankovicz and T. Kishkovsky) in Leningrad.

200. **T. pseudonigricans** Hand.-Mazz. apud Penth. and Zederb. in Annal. Nat. Hofmus. Wien (1906) 427 and Monogr. Tarax. (1907) 51.—**Ic.**: Hand.-Mazz. ibid. (1907) t. 2, fig. 3, t. 4, fig. 8.

Perennial. Plant 10–25 cm high, root collar with fewer remnants of dead leaves, with rather profuse brownish tomentum in their axils. Leaves 8–18 cm long and 1–6 cm wide, somewhat thickish, green, subglabrous, deeply runcinately pinnatipartite with more or less deflexed four to eight lateral lobes, often having toothed upper margin on each side, and small terminal lobe, often with intermediate lobules and teeth. Scapes glabrous or with isolated hairs below capitula. Involucres 15–18 mm long, glaucescent-green; involucral bracts without or with indistinct cornicle; outer bracts broadly ovate to broadly lanceolate, not closely appressed to inner bracts and slightly wider than them, with wide scarious border; inner bracts oblong-linear, one and one-half to two times as long as longest outer bracts. Florets yellow. Achenes light brown; body 5–6 mm long, with fewer longitudinal furrows, with acute tubercles in the upper third, only with short obtuse tubercles below, coalescing into transverse ridges; cone 1.0–1.5 mm long; beak 6–9 mm long; pappus 6–7 mm long, whitish, often with weak brownish tinge. Flowering May to June.

Grassy patches, gravel-beds, on stony slopes in middle and upper mountain zones.—*Caucasus*: Southern and Eastern Transcaucasia. *General*

distribution: Asia Minor, Armenia and Kurdistan, Iran, Cyprus, ?Indo-Himalayas. Described from Turkey. Type in Vienna.

201. **T. seravschanicum** Schischk. sp. nova in Addenda XXVIII, 753.

Perennial. Plants 8–20 cm high, with rather thick root; root collar covered with dark brown remnants of dead leaves, with fewer flexuous hairs in their axils. Leaves 7–20 cm long and 1.5–4.5 cm wide, subglabrous, long-acuminate, runcinately pinnatipartite with narrow, long, five to nine lateral lobes on each side, often having more or less toothed anterior margin and small terminal lobe, usually with rather numerous intermediate lobules and teeth. Scapes weakly arachnoid pubescent below capitula. Involucre 13–20 mm long, green; outer involucral bracts broadly ovate to broadly lanceolate, not closely appressed to inner bracts, almost as wide or slightly wider than them, membranous, with wide scarious border, with rather large, subobtus subterminal cornicle, inner bracts oblong-linear, two and one-half to three times as long as longest outer bracts, with rather large subobtus cornicle. Florets yellow, corolla short hairy in the middle part. Achenes light brown; body about 4.5 mm long, with fewer longitudinal furrows, with rather long, acute, tubercles, in the upper third, only with very small spinules below; cone 0.8–1.0 mm long; beak of immature achenes 4–5 mm long, later to 7–9 mm long; pappus 7–8 mm long, white. Flowering June to July.

Herb slopes, forest glades, meadows, in juniper forests in middle mountain zone.—*Soviet Central Asia*: Pamiro-Alai (western part). Endemic. Described from Zeravshan Range. Type (Zeravshan Range, Masarif Sai, 24.VII.1931, No. 413, S. Nikitin) in Leningrad.

202. **T. tenuisectum** Somm. and Lev. in Tr. Peterb. Bot. Sada, XVI (1900) 294; Schischk. in Grossh. Fl. Kavk. IV (1934) 248; Grossh. Opred. Rast. Kavk. (1949) 513; Kapeller in Fl. Gruzii, VIII, 660; Sofieva in Fl. Azerb. VIII, 539.—*T. dissectum* auct. non Ldb.: Hand.-Mazz. Monogr. Tarax. (1907) 47, p. p.—**!c.**: Kapeller, op. cit. Plate 436.

Perennial. Plants 2–8 cm high, with rather thick vertical root; root collar covered with dark brown remnants of dead leaves, with more or less profuse arachnoid-hairy tomentum of long flexuous hairs between bases of their petioles. Leaves 2–8 cm long and 7–20 mm wide, more or less arachnoid pubescent (especially on petioles and along midrib), deeply and uniformly pinnatipartite, with rather numerous lanceolate, usually deflexed lateral lobes and much smaller intermediate lobules between them; terminal lobe small. Scapes solitary or two or three, usually shorter than leaves, with rather profuse, lax arachnoid-hairy tomentum below capitula. Involucre 8–11 mm long, green; involucral bracts herbaceous,

with narrow scarious border and more or less ciliate from flexuous hairs, with or without very short indistinct cornicle, outer involucre bracts lanceolate-ovate to lanceolate, appressed to inner, almost as wide or wider than them; inner involucre bracts oblong-linear, one and one-half to two times as long as longest outer bracts. Florets whitish or yellowish-white (?), peripheral florets with wide dark stripe on the lower side of ligule, corolla glabrous or subglabrous. Achenes light brown, body 3–4 mm long, with rather numerous narrow ribs, with fewer acute tubercles in the upper third; cone conical, 0.5–0.8 mm long, gradually terminating in 2.0–3.5 mm-long beak; pappus 4–5 mm long, whitish often with grayish tinge. Flowering July to August.

Alpine and subalpine meadows, stony slopes and talus in upper mountain zone.—*Caucasus*: Ciscaucasia, Eastern and Western Transcaucasia, Dagestan. Endemic. Described from Elbrus Mountains. Type in Florence; isotype in Leningrad.

Uncertain Names

1. ***T. angrenicum*** S. Koval. in Fl. Uzb. VI (1902) 456 nom. nudum.
2. ***T. caucasicum*** (Stev.) DC. Prodr. VII (1838) 146, p. p.; Ldb. Fl. Ross. II (1846) 813, p. p. = *Leontodon caucasicum* Stev. in Mem. Soc. Nat. Mosc. IV (1812–1813) 100; M.B. Fl. taur.-cauc. III (1819) 530, non M.B. ex Fisch. (1812).— I have not seen the authentic specimens of this species, which was described from the Terek River valley. The monograph of the genus by H. Handel-Mazzetti relegates it, although with doubt, to the synonyms of *T. megalorrhizon* (Forsk.) Hand.-Mazz. sensu lato. If this is actually so, then *T. caucasicum* DC. is the priority name for *T. ciscaucasicum* Schischk. However, in my opinion, it is more probable that *T. caucasicum* is identical with the earlier described species *T. bessarabicum* (Hornem.) Hand.-Mazz.

3. ***T. jakimovae*** S. Koval. op. cit. 456, nom. nudum.
4. ***T. sevastopoliense*** P. Medw. in Bot. Zhurn. SSSR. XLVI, 6 (1961) 892, nom. nudum.

GENUS 1668. ***Chondrilla*** L.^{1, 2}

L. Sp. pl. (1753) 796; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 1–61.

Capitula numerous, in groups of one to three, terminal on branches,

¹ Treatment by T.G. Leonova.

² From the Greek word *chondros*—cartilage, node; named for its nodulose roots, caused by the secretion of latex.

on reduced lateral shoots or on peduncles, with 5–12 bisexual ligulate florets. Involucres narrowly cylindrical, 10–15 mm long, about 2.0–2.5 mm wide; involucre bracts five to nine, coriaceous-herbaceous, with arachnoid hairy pubescence on the outer side, outer bracts very small, to 1–2 mm long, ovate, imbricate; inner bracts lanceolate-linear, acuminate, 10–15 mm long, one-rowed, scarious along margin, sometimes with setaceous hairs along midrib. Receptacle flat, glabrous. Corolla yellow with long tube, covered with short, upright, setaceous hairs and with five
 561 toothed limb. Stamens with glabrous filaments; anthers with very short, flat, scarious, entire or slightly incised, appendages at base. Style long, bipartite; style branches long, filiform, densely papillose. Achenes all alike, with more or less long beak and pappus of numerous bristles equal in length, in turn covered with very short (visible only under high magnification) secondary bristles; achene body 2.5–11.0 mm long and about 1 mm wide, narrowly cylindrical, narrowed toward base, with five longitudinal ribs covered with very short (visible only under high magnification) hairs, with fine tubercles and scales in the upper part (sometimes almost from middle) with corona of five membranous, entire or three-lobed scales at the apex, less often without corona; beak (including beak-like part of the achene below articulation) 0.1–6.0 mm long, entirely, smooth, articulated at the base (above corona) or above (sometimes near the middle or even slightly above), and then readily breaking along articulation together with pappus, or without articulation (sometimes with indistinct articulation) and then breaking irregularly. Perennials, less often biennial herbs, more or less branched from the base or only in the upper part, with more or less developed tomentum, most dense in the lower part of stem, less often glabrous with setaceous hairs in the lower part of stem, less often without, middle and upper cauline leaves alternate, undivided and entire; lower cauline leaves and leaves of basal rosettes (if present) usually more or less runcinately divided.

Type of genus: *C. juncea* L.

The nearly 30 species of the genus are distributed primarily in the ancient Mediterranean area. Of these, 22 species are found in the USSR. The subgenus *Chondrilla*, the richest in species, is divided into four sections, one of which, *Lagoseropsis* Iljin, includes only the western European species, and three are represented mainly in the territory of the USSR. The second subgenus, *Brachyrhynchus* (Iljin) Leonova, includes mostly the Soviet Central Asian species.

Note. According to M.M. Iljin (1930), all or at least the majority of the species of this genus, are apomicts. Actually, the fact that not all species of the genus *Chondrilla* can be apomicts is indicated by the investigations of R.V. Karishnev (*Bot. Zhurn.* 4 (1932) 401), which show

that *C. ambigua* is a cross-pollinated plant. Another biological peculiarity of the genus *Chondrilla* is its capacity to form laticiferous calluses on the roots and the underground part of the stem, which are especially large in members of the subgenus *Brachyrhynchus*.

Economic Importance. All species of this genus are laticiferous; moreover, until quite recently some species (especially species of the subgenus *Brachyrhynchus*), were considered promising for commercial exploitation of rubber.

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1. Inner involucre bracts eight, less often seven to nine, often with bristles along midrib; capitulum with 11 florets, less often 9–12 (subgenus *Chondrilla*) 2.
 - + Inner involucre bracts five, less often six (seven), always without bristles along midrib; capitulum with five florets, less often six or seven (subgenus *Brachyrhynchus*) 17.
 2. Achene beak without articulation, less often articulation indistinct, breaking irregularly 3.
 - + Achene beak or only its upper part with pappus readily breaking along distinct articulation (Section *Arthrorhynchus*) 11.
 3. Achene body 5–7 mm long; beak thick, broadened in the lower part without trace of articulation (section *Pachyrhynchus*) 16. *C. kusnezovii* Iljin.
 - + Achene body 2.5–4.5(5.0) mm long; beak slender, without articulation or articulation indistinct (section *Chondrilla*) 4.
 4. Cauline leaves narrowly linear to linear-lanceolate, less often lanceolate, 0.5–3.0(6.0) mm wide, glabrous, as also part of stem 5.
 - + Cauline leaves wider, lanceolate to broadly ovate, (5)10–30(40) mm wide, as also stem mostly with more or less dense arachnoid pubescence 8.
 5. Achene body with one or two transverse rows of wide and undivided scales; crown scales short and wide, obtuse or obtusely three-toothed; beak (0.5)1.6–2.5 mm long (very rarely 3.5 mm long) 3. *C. brevirostris* Fisch. and Mey.
 - + Achene body with small and acute tubercles or wide but with emarginate or three-toothed scales; crown scales narrowed above, acuminate, undivided, beak (3)4–6 mm long 6.
 6. Inner involucre bracts without bristles; achene body densely covered with small and acute tubercles and scales in the upper one-fourth to three-fourths, upper tubercles and scales rather long 1. *C. juncea* L.
 - + Inner involucre bracts with bristles along midrib; achene body with wide and short scales only in the upper part 7.

7. Inner involucre bracts with stiff, long and dense bristles along midrib; scales of the upper row on achene body three-lobed; beak slender, 4–5 mm long 4. *C. acantholepis* Boiss.
- + Inner involucre bracts with short and sparse bristles along midrib, scales of the upper row on achene body with deep and wide sinus in the middle; beak more slender, 3–4 mm long 2. *C. graminea* M.B.
8. Crown scales three-lobed, with well-developed middle lobe, entire plant canescent from more or less dense arachnoid-hairy pubescence 7. *C. canescens* Kar. and Kir.
- 563 + Crown scales smooth; plants glabrous or with dense tomentose pubescence in the upper part 9.
9. Crown scales 0.2–0.5 mm long; achene body with indistinct tubercles in the upper part; cauline leaves 0.5–1.0 cm wide, only sometimes with occasional bristles along margin 8. *C. gibbistrois* M. Pop.
- + Crown scales 0.8–1.0 mm long; achene body with distinct scales in the upper part, cauline leaves 1–3 cm wide, with dense stiff bristles along margin and beneath along midrib, less often without 10.
10. Crown scales ovate; achene body with long, undivided, overlying scales; middle part of stem glabrous, less often with sparse pubescence 5. *C. latifolia* M.B.
- + Crown scales lanceolate-linear; achene body with small tubercles and scales in the upper part, uppermost tubercles and scales long and incised; stem densely tomentose all-over 6. *C. aspera* (Schrad. ex Willd.) Poir.
11. Articulation of beak at its base (directly above corona) or slightly above, but always much lower than the middle of beak 12.
- + Articulation of beak near its middle or slightly lower, less often above the middle 15.
12. Crown scales three-lobed 13.
- + Crown scales undivided 14.
13. Achene body without scales; crown scales short, incised into three lobes of equal length; beak thick, 0.75–1.10 (1.5) mm long 9. *C. piptocoma* Fisch. and Mey.
- + Achene body with two or three rows of small tubercles and scales in the middle part, uppermost tubercles and scales larger, three-lobed; crown scales large, with distinct middle lobe; beak slender, 1.25–3.0 (4.0) mm long 10. *C. leiosperma* Kar. and Kir.
14. Crown scales oblong-linear, acuminate; articulation of beak at its base 11. *C. rouillieri* Kar. and Kir.
- + Crown scales wider, truncate and erose at the apex, or rounded

- and broadly spatulate; articulation of beak above its base, above or below the upper margin of corona scales 12. **C. laticoronata** Leonova
15. Inner involucre bracts without bristles; beak straight, thick, its articulation indistinct and without constriction; achene body with one row of wide scales and one or two rows of smaller scales in the upper part 15 **C. ornata** Iljin.
- 564 + Inner involucre bracts usually with blackish bristles along midrib; beak with distinct articulation and constriction at place of articulation; achene body smooth or with occasional small tubercles 16.
16. Crown of undivided or three-lobed scales, middle lobe larger and rounded, crown sometimes undeveloped or absent 13. **C. phaeocephala** Rupr.
- + Crown undeveloped and with sparser, small, acute scales and tubercles 14. **C. maracandica** Rupr.
17. Achene body without corona or only with indistinct corona of sparse small scales and tubercles; capitulum always with five inner involucre bracts and florets 18.
- + Achene body with distinct corona; capitulum with five or six (seven) inner involucre bracts and florets 19.
18. All cauline leaves entire, only lowermost sometimes with isolated teeth; Achene body 5–7 mm long, beak 0.1–0.3 (0.5) mm long, narrowed above 17. **C. ambigua** Fisch. ex Kar. and Kir.
- + Lower and middle cauline leaves runcinate or only with one to three teeth; Achene body 8–11 mm long, beak (0.2) 0.5–1.5 mm long, clavately broadened above 19. **C. macrocarpa** Leonova
19. Crown scales undivided, ovate 20. **C. macra** Iljin
- + Crown scales three-lobed 20.
20. Crown scales wide and short, their lobes almost equal in length (individual achenes with scales reduced to individual tubercles) 19. **C. pauciflora** Ldb.
- + Crown scales with larger middle lobe and reduced or undeveloped lateral lobes (partly scales undivided) 21.
21. Crown scales wide and short, about 0.3 mm long, with obtuse deltoid middle lobe; beak 0.5–1.0 mm long, thick 21. **C. mujunkumensis** Iljin and Igol.
- + Crown scales long, 0.5–1.0 mm long, with narrow acuminate lobes; beak (1.0) 1.25–1.75 mm long, slender 22. **C. bosseana** Iljin

Subgenus 1. Chondrilla. Inner involucre bracts eight (less often seven to nine), often with bristles along midrib, capitulum with (9)11(12) florets.

Type of subgenus: type of genus.

- 565 **Section 1. Chondrilla.**—Sect. *Euchondrilla* Endl. Gen. Pl. (1836–1844) 499.—Stem always densely white tomentose and with stiff, more or less dense, long setaceous hairs in the lower part; rosette of basal leaves (usually withered at flowering time) always present. Achene body 2.5–4.0(5.0) mm long, beak slender, without articulation or articulation indistinct in the lower part, breaking irregularly.

Type of section: type of genus.

Note. Besides the species described below, this section also includes *C. ramosissima* Sibth. and Smith, found in Greece.

Series 1. Junceae Leonova.—Cauline leaves narrowly linear to linear-lanceolate, less often lanceolate, 0.5–3.6(6.0) mm wide, as also upper part of stem glabrous.

1. **C. juncea** L. Sp. pl. (1753) 796; Ldb. Fl. Ross. II, 2, 808; Hegi Ill. Fl. VI, 2, 1072; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 50 p. p; in Fl. Yugo-Vost. VI, 456, p. p; in Sb. Kauchuk i Kauchukon. II (1953) 607, p. p; in Fl. Turkm. VII (1960) 315; Grossh. Fl. Kavk. IV (1934) 244; Kolakovskii, Fl. Abkhazii IV, 297; Soó and Jávorka, Magyar Növen. Kezikönyve II (1951) 719; Dumbadze in Fl. Gruzii, VIII, 655, Szaf., Kulcz., B. Pawl. Rosl. Polskie (1953) 737; Mikhail. in Fl. BSSR, V, 182; Kitam. Fl. Afghan. (1960) 398; Aliev in Fl. Azerb. VIII, 533.—*C. juncea* B. rigens DC. Prodr. VII, 1 (1838) 142.—*C. Juncea* α. *vulgaris* Schmalh. Fl. II (1897) 149.—*C. juncea* subsp. *glabrescens* Iljin, op. cit. (1930) 53.—*C. viscosa* Gilib. Fl. Lithuan. I (1792) 187.—*C. virgata* J. and C. Presl, Delic. Prag. (1822) 116.—*C. gaudinii* Hegetschw. in Suter, Helv. Fl. ed. II, 2 (1822) 162.—*C. angustifolia* Hegetschw. Fl. Schw. (1840) 762.—*C. laciniata* Stev. in Bull. Soc. Nat. Mosc. XXIX, 4 (1856) 410.—**Ic.:** Jávorka and Csapody, Iconogr. fl. Hungar. I (1929) 557, No. 4004 s; Dostal, Květena CSR (1950) 1493, t. 486, 2.—**Exs.:** Fl. exs. Reipubl. Bohem. Sloven. No. 982; Sintenis. Iter. or. No. 7444; Fl. Gall. Germ. exs. No. 2874.

Perennial or biennial. Stem 50–100 cm high, to 6 mm thick, branched almost from the base or slightly higher, with virgate green branches, glabrous, less often canescent or very finely arachnoid-hairy pubescent in inflorescence; setaceous hairs in the lower part of stem stiff, rather long, mostly directed downward. Leaves of basal rosette and lowermost cauline leaves runcinate, 7.0–13.5 cm long, about 3 cm wide, other leaves narrowly linear to lanceolate, flat, 3–8 cm long, (1) 2–6 mm wide, entire, sometimes with occasional bristles along margin, acute or obtuse. Capitula 16–19 mm long at fruiting, terminal on branches or in groups of one to three on short,

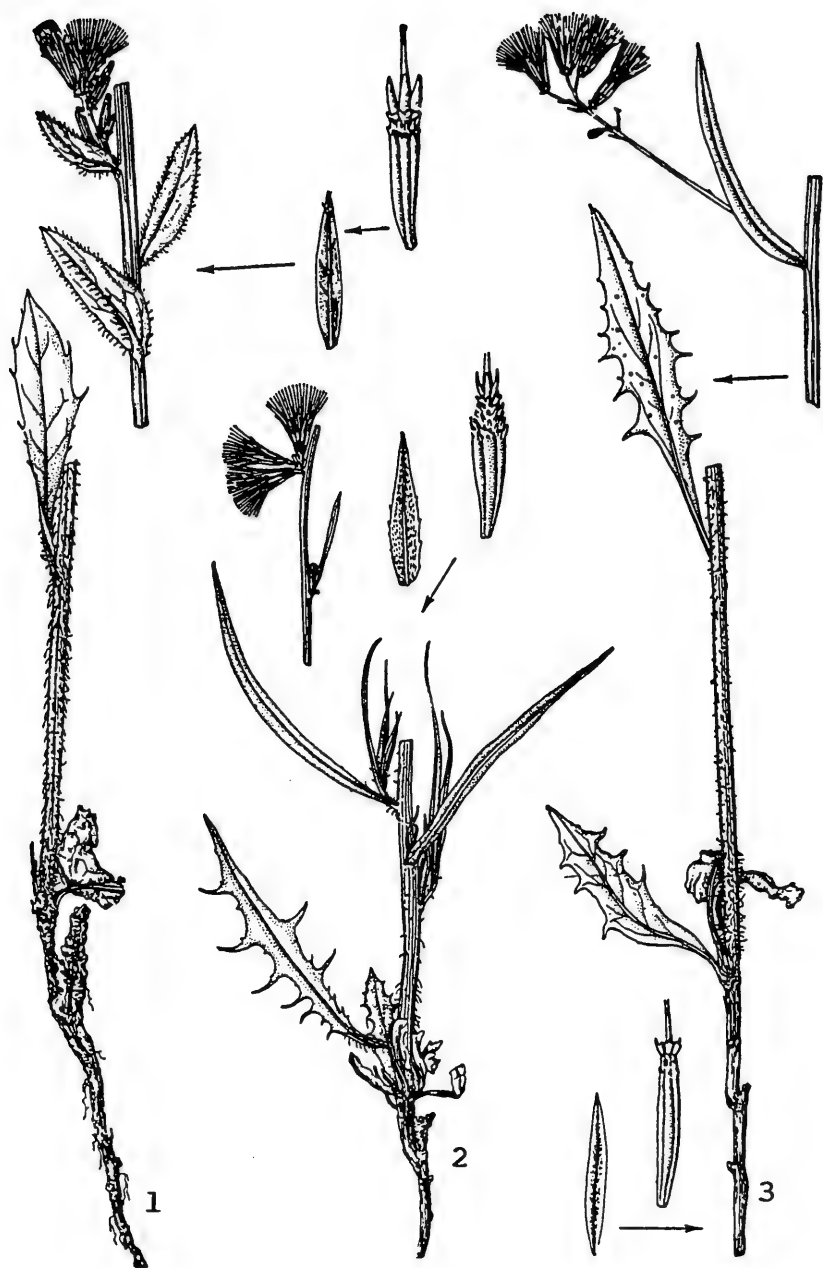
0.2–0.4 mm long, densely tomentose peduncles, with (8)11(12)-florets. Inner involucre bracts without bristles. Achene body 3–4 mm long, upper one-fourth to three-fourths part densely covered with small and acute
 566 tubercles and scales, upper tubercles and scales longer, sometimes toothed, deflected outward; crown of five smooth, ovate or oblong, acuminate, 0.5–1.0 mm-long scales; beak 4–6 mm long, one and one-half to two times as long as achene body, slender, not clavate or weakly thickened in the upper part; pappus 6–8(9) mm long. Flowering June to September. (Plate XXVII, Fig. 2).

Sandy steppes, sands of river valleys and near seacoasts, sandy glades in pine forests, stony and sandy loam slopes of foothills and lower mountain zone, gravel-beds, sometimes as weed along roads and in crop fields.—*European Part*: Upper Dnieper (basins of Pripyat, Dnieper, Desna rivers), Middle Dnieper, Upper Dniester, Bessarabia, Black Sea Region, Volga-Don (except southern and southeastern parts), Lower Don (western part), Crimea; *Caucasus*: all regions; *Soviet Central Asia*: mountainous Turkmenia, Aralo-Caspian (? Mangyshlak). *General distribution*: Atlantic Europe (southern part), central Europe, western Mediterranean (including Tunisia), eastern Mediterranean (Syria), Balkans-Asia Minor, Armenia and Kurdistan, Iran (northern Iran, possibly Afghanistan). Described from western Europe. Type in London.

Note. *C. juncea* does not have as wide a distribution as was believed earlier. It does not extend eastward beyond the Volga River and is not found in Siberia, Kazakhstan, nor in the mountains of Soviet Central Asia. In these regions, specimens of the unjustly forgotten species *C. canescens* were identified as *C. juncea*.

2. ***C. graminea*** M.B. Fl. taur.-cauc. II (1808) 244; III (1819) 528; Ldb Fl. Ross. II, 2, 809; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 53; in Fl. Yugo-Vost. VI, 457, Grossh. Fl. Kavk. IV (1934) 244.—*C. graminifolia* M.B. ex Fisch. Catal. Hort. Gorenk. (1812) 33, nomen.—*C. juncea* β. *graminea* (M.B.) Schmalh. Fl. II (1897) 149.—*Prenanthes chondrilloides* auct. non Ard.: Pall. Reise III (1776) 537.

Biennial or perennial. Stem (20)30–100 cm high 15–5.0 mm thick, branched from the base or slightly above, with slender virgate branches, glabrous, less often with scattered arachnoid-hairy pubescence in inflorescence; setaceous hairs in the lower part of stem dense, fine, mostly spreading horizontally. Leaves of basal rosette and lowermost cauline leaves runcinate, 13–15 cm long, 0.5–4.5 cm wide; other leaves narrowly linear to linear-lanceolate, 5.0–8.5 cm long, 0.5–2.5(3.0) mm wide, flat, entire, less often with bristles along margin in the lower part, acute. Capitula 14–18 mm long at fruiting, terminal on branches or on densely tomentose, 0.5–0.8 mm long peduncles, with 11 florets. Inner involucre



bracts 12–14 mm long, with short, more or less densely arachnoid pubescence on the outer side, sometimes with isolated short bristles along midrib. Achene body 2.5–4.0 mm long, upper part with one or two (three) rows of wide and very short scales, upper scales longer, usually with deep and wide sinus in middle, horizontal, less often scales covering up to half-length of achene body, crown with five oblong, narrow and acuminate, 0.5 mm-long scales; beak 3–4 (5) mm long, slightly longer, less often as long or slightly shorter than achene body, thicker, clavate in the upper part, pappus 6–8 mm long. Flowering June to September (October).

Sandy steppes, pine forest glades, shifting sands, sometimes as weed in crop fields and gardens.—*European Part*: Middle Dnieper (eastward from left bank of Dnieper), Bessarabia (Tiraspol). Black Sea Region, Volga-Don (southern and southeastern parts), Trans-Volga (except northern part), Lower Volga, Lower Don. Endemic. Described from vicinity of Astrakhan. Type in Leningrad.

3. **C. brevirostris** Fisch. and Mey. Ind. Sem. Hort. Petrop. III (1837) 32; DC. Prodr. VII, 1, 142; Ldb. Fl. Ross. II, 2, 808; O. and B. Fedtsch. Perech. Rast. Turk. III. 323; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 55; in Fl. Yugo-Vost. VI, 457; in Sb. Kauchuk i Kauchukon. II (1953) 609; Pavlov, Fl. Tsentr. Kazakhst. III (1938) 353; Krylov, Fl. Zap. Sib. XI, 3015.—*C. juncea* auct. non L.: Ldb. Fl. alt. IV (1833) 147, excl. syn.—*C. filifolia* Iljin in Byull. Otdel. Kauchukon. 3 (1903) 60.—*C. brevirostris* var. *paucisquamata* Iljin and Igolk. in Sov. Bot. 6 (1935) 86, 88.

Perennial. Stem 50–100 cm high, 1.5–10.0 mm thick, branched from the base or above, with slender, virgate, glabrous branches; setaceous hairs in the lower part of stem rather long, scattered or dense, reaching almost the middle of stem. Leaves of basal rosette oblong-spatulate, runcinate, about 11 cm long and 1.5 cm wide; lower cauline leaves linear, about 11 cm long and 5 mm wide, weakly incised; other leaves narrowly linear to lanceolate, 1.5–7.0 cm long, 1–4 mm wide, entire, sometimes with scattered bristles in the lower part. Capitula 12–16 mm long at fruiting, terminal on branches or on pubescent, 0.3–0.7 mm long peduncles, with (9)11(12) florets. Inner involucre bracts 10–12 mm long, with scattered short arachnoid-hairy pubescence on the outer side, occasionally with few small bristles along midrib. Achene body 4–5 mm, upper part with one or two (less often more) rows of wide and smooth short scales, upper scales longer and often deflected; crown of five undivided and wide scales, 0.2–0.5 mm long, obtuse, slightly rounded or obtuse, three-lobed; beak (0.5)1.0–2.5, very rarely 3.5 mm long, two-thirds to one-fourth (one-eighth) as long as achene body, clavate in the upper part; pappus 7–10 mm long. Flowering June to September.

Clayey, stony and sandy steppes, pine forest glades, semi-overgrown "barhans" [sand dunes], in gravel-beds, less often as weed in crops.—*European Part*: Trans-Volga (Uralsk), Lower Volga; *Soviet Central Asia*: Aralo-Caspian (except southern part), Balkhash Region, Dzhungaria-Tarbagatai, Syr-Darya, Tien Shan; *Western Siberia*: Upper Tobol (southern part), Irtysh, Altai. *General distribution*: Dzhungaria-Kashgaria. Described from Altai. Type in Leningrad.

569 **Note.** Authentic specimens (a type specimen was not mentioned in the description) of *C. filifolia*, described from the area between the Volga and Chinese Dzhungaria, do not differ significantly from *C. brevirostris*. According to the original diagnosis of *C. filifolia*, the major distinguishing character of this species is the very narrow, "filiform-setaceous" leaves. However, in *C. brevirostris*, too, the cauline leaves are strongly variable in width.

4. ***C. acantholepis*** Boiss. Diagn. pl. or. ser. II, 11 (1849) 48; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 59; in Fl. Yugo-Vost. VI, 457; in Sb. Kauchuk i Kauchukon. II (1953) 608; Grossh. Fl. Kavk. IV (1934) 244; Dumbadze in Fl. Gruzii, VIII, 655.—*C. glomerata* C. Koch in Linnaea XXIII (1850) 673; Trautv. in Tr. Peterb. Bot. Sada VIII, 2 (1883) 522.—*C. juncea* β. *acantholepis* (Boiss.) Boiss. Fl. or. III (1875) 792.—*C. juncea* var. *acantholepis* (Boiss.) Aliev in Fl. Azerb. VIII (1961) 533.

Perennial or biennial. Stem (40)60–125 cm high, to 7 mm thick, divaricately branched above the base, with slender, virgate, glabrous branches, often with bristles; setaceous hairs long and dense in the lower part of stem. Leaves of basal rosette 8 cm long and 3.5 cm wide; cauline leaves narrowly linear (almost filiform) to linear-lanceolate, 1–8(12) cm long and 0.5–3.0(6.0) mm wide, entire, with two or several bristles along margin in the lower part, acuminate. Capitula 13–15 mm long at fruiting, on densely tomentose, 0.5–0.7 cm long peduncles or sessile, mostly with 11 florets. Inner involucre bracts 9–12 mm long, with thin arachnoid-hairy pubescence on the outer side or subglabrous, with more or less dense, stiff, and long (to 2 mm), yellowish bristles along midrib. Achene body 2.5–3.0 mm long, upper part with fine tubercles and one row of short and wide, three-lobed, deflected scales; crown of five smooth, ovate or oblong, 0.5 mm-long scales, obtuse or acute; beak (3.5)4.0–5.0 mm long and 1.3–1.7 times as long as achene body, slender, clavate in the upper part; pappus 6–7 mm long. Flowering June to September (October).

Sands and gravel-beds, stony and rubbly slopes of mountains and foothills to 1,100–2,300 m, sometimes as weed.—*European Part*: Crimea (rarely); *Caucasus*: Eastern, Western and Southern Transcaucasia, Talysh; *Soviet Central Asia*: mountainous Turkmenia. *General distribution*: Balkans-Asia Minor (extreme east), Armenia and Kurdistan, Iran (northern part).

Described from Iran, from Demavend Mountain. Type in Geneva; isotype in Leningrad.

Series 2. Latifoliae Leonova.—Cauline leaves wide, lanceolate to broadly ovate, (0.5)1.0–3.0(4.0) cm wide, as also stem mostly with more or less dense arachnoid pubescence.

- 570 5. *C. latifolia* M.B. Fl. taur.-cauc. II (1808) 244; Koch, Synops. Fl. Germ. (1837) 429; DC. Prodr. VII, 1, 142; Ldb. Fl. Ross. II, 2, 810.—*C. rigens* Rchb. Fl. Germ. exs. II (1831) 271.—*C. acanthophylla* Borkh. in Rchb. ibid, 271.—*C. intybacea* Frivaldsk. in Flora SVIII (1835) 335.—*C. juncea* γ. *acantholepis* (Borkh.) DC. Prodr. VII, 1 (1838) 14.—*C. juncea* γ. *latifolia* (M.B.) Koch, Synops. Fl. Germ. ed. 2, II (1844) 493; Boiss. Fl. or. III, 792.—*C. juncea* ssp. *canescens* var. *latifolia* (M.B.) Koch ex Iljin in Byull. Otdel. Kauchukon. 3 (1930) 52.—*C. hajastanica* Sonsn. in Grossh Fl. Kavk. IV (1934) 224; Aliev in Fl. Azerb. VIII (1961) 533.

Perennial or biennial. Stem 50–120 cm high, to 9 mm thick, weakly ribbed, densely leafy, branched almost from the middle or only in the upper part, peduncles (as also lower part of stem) densely tomentose, stem glabrous in remaining part, less often with arachnoid-hairy pubescence and with scattered bristles; setaceous hairs in the lower part of stem long and dense. Leaves of basal rosette and lower cauline leaves obovate and somewhat runcinate; less often narrowed toward base, coriaceous, 7–13 cm long and 2–4 cm wide; other leaves coriaceous, from lanceolate and ovate to broadly lanceolate and broadly ovate, (1.0) 3.5–9.0 cm long, (0.5)1.0–2.5 cm wide, with rather dense bristles along margin and beneath along midrib, glabrous or sparsely arachnoid-hairy pubescent, acute or obtuse. Capitula 13–17 mm long at fruiting, on densely tomentose, 3–5 mm-long peduncles or terminal on branches, with 11 florets. Inner involucre bracts 11–12 mm long, densely tomentose on the outer side, with scattered or more or less dense, thick, and long bristles along midrib, (sometimes bristles on involucre bracts absent, but then bristles more distinct on leaves). Achene body 3–4 mm long, in the upper part with tubercles and mostly with long and wide, overlying, appressed smooth scales; crown of five long and wide, 0.8–1.0 mm-long, 0.5-mm wide, ovate, acuminate scales; beak 3.5–5.0 mm long, almost as long as or one and one-half times as long as achene body, clavate in the upper part; pappus (5)6–8 mm long. Flowering June to August. (Plate XXVII, Fig. 1).

Sands, steppes, gravel-beds and rubbly mountain slopes, often as weed in crop fields.—*European Part*: Middle Dnieper (southern part), Bessarabia, Black Sea Region, Volga-Don (southern part), Trans-Volga (southern part), Lower Don, Crimea; *Caucasus*: All regions (except Western Transcaucasia); *Soviet Central Asia*: mountainous Turkmenia.

General distribution: Central Europe, western Mediterranean (upper reaches of Rhone), Balkans-Asia Minor (eastern part), Iran (northern part). Described from Crimea. Type in Leningrad.

Note. Unlike M.M. Iljin (1930) and many other authors, I consider it possible to distinguish this species as separate from *C. juncea*. In my opinion, *C. hajastanica*, described from the Nakhichevan ASSR is a more recent synonym of *C. latifolia*. This species grows in the middle mountain zone in rubbly places and gravel-beds, i.e., in the same ecological conditions as *C. latifolia*. The only specimen of *C. hajastanica* seen by me with a description by A.A. Grossheim (Nachitschevan, prope p. Bitschenach, 29.VII.1932) like many other specimens collected from the Nakhichevanchai River, is entirely identical with the type specimen of *C. latifolia*.

6. *C. aspera* (Schrad. ex Willd.) Poir. in Encycl. meth. Suppl. II (1811) 329.—*C. stricta* Ldb. Fl. Alt. IV (1833) 146; Fl. Ross. III, 2, 810; DC. Prodr. VII, 1, 142; Krylov, Fl. A1. III (1904) 743; Fl. Zap. Sib. XI, 3015; O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 324; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 57.—*C. juncea* var. *latifolia* auct. non Boiss.: Franch. Pl. d. Turk. Miss. Capus (1883) 112; O. and B. Fedtsch. in Tr. Peterb. Bot. Sada XXVIII, 1 (1908) 36.—*C. latifolia* auct. non M.B.: O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 325.—*C. schraderei* Steud. Nomencl. bot. ed. 2, II (1841) 393.—*Prenanthes aspera* Schrad. ex Willd. Sp. pl. III, 3 (1803) 1539, non Michx. 1803.—*Youngia aspera* (Schrad. ex Willd.) Steud. op. cit. (1841) 393.— **Ic.:** Ldb. Icon. Pl. Fl. Ross. I (1829) t. 37.

Perennial. Stem 60–115 cm high, up to 9 mm thick, slightly ribbed, densely leafy, branched above base, tomentose pubescent throughout, especially dense in inflorescence; stiff setaceous hairs in the lower part of stem dense and long, sometimes all over stems and branches. Leaves of basal rosette and lowermost cauline leaves runcinate, coriaceous, oblong-obovate, 6–18 cm long, about 5 cm wide, arachnoid-hairy pubescent, beneath along midrib with bristles; other leaves coriaceous, oblong-ovate to broadly ovate (upper sometimes lanceolate), 2–10 cm long, (0.5)1.0–3.0 cm wide, with dense stiff bristles along margin (all or only middle leaves), mostly with densely arachnoid-hairy pubescence and bristles beneath along midrib, obtuse, lower part subamplexicaul. Capitula 15–18 mm long at fruiting, on 0.8–1.0 cm long, or densely tomentose peduncles, or terminal on branches, with 10–12 florets. Inner involucre bracts 12–13 mm long, densely tomentose on the outer side, usually with stiff and dense bristles along midrib. Achene body 3–4 mm long, upper part (sometimes from middle) with small tubercles and scales, uppermost tubercles and scales sometimes rather long and scattered; crown of five

narrow, lanceolate-linear, acute, 1 mm long scales; beak (1)3–4(5) mm long, clavate in the upper part; pappus 6–8 mm long. Flowering July to September.

Sandy and sandy-loam steppes, stony and rubbly slopes, rocks and gravel-beds, sandy ridges or river valleys, up to 2,000 m, sometimes as weed in crop fields and along banks of irrigation channels.—*Soviet Central Asia*: Balkhash Region (eastern part), Dzhungaria-Tarbagatai, Tien Shan, Syr-Darya, Pamiro-Alai (northern part); *Western Siberia*: Irtysh (southeastern part), Altai. *General distribution*: ?Dzhungaria-Kashgaria. Described from cultivated specimens from unknown location. Type in Leningrad.

- 572 7. *C. canescans* Kar. and Kir. in Bull. Soc. Nat. Mosc. XV (1842) 397; Pavlov, Fl. Tsentr. Kazakhst. III (1938) 353.—*C. juncea* var. *canescens* (Kar. and Kir.) Trautv. in Bull. Soc. Nat. Mosc. XXXIX, 2 (1866) 384.—*C. juncea* d. *canescens* (Kar. and Kir.) Schmalh. Fl. II (1897) 150.—*C. juncea* subsp. *canescens* (Kar. and Kir.) Iljin in Byull. Otdel. Kauchukon. 3 (1930) 52.—*C. juncea* auct. non L.: Boiss. Fl. or. III (1875) 792; O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 325; Pavlov, op. cit. III (1938) 352; Krylov, Fl. Zap. Sib. XI, 3014; Kovalevskaya in Fl. Uzb. VI, 454.—*C. intybacea* auct. non Frivaldsk.: Trautv. op. cit. (1866) 385.—*C. gummifera* Iljin in Byull. Otdel. Kauchukon. 3 (1930) 56; in Fl. Yugo-Vost. VI, 458.—*C. coronifera* Iljin f. *latifolia* Iljin, op. cit. (1930) 47.—*C. bornmuelleri* Haeckel in Fedde, Repert. Beih. 108 (1938) 69 and interim. —*!c.*: Kovalevskaya, op. cit. Plate 45, Fig. 2 (sub *C. juncea*).

Perennial or biennial. Stem 75–150 cm high, 10 mm thick, branched above base, sometimes almost from the middle, light green, as also branches, glaucescent from tomentose pubescence, especially dense in inflorescence; less often subglabrous; setaceous hairs at the base of stem scattered and short. Leaves of basal rosette indistinct; lower and middle cauline leaves lanceolate, ovate or oblong-elliptical, sometimes runcinate and strongly narrowed towards base; other leaves lanceolate to linear-lanceolate, to 7.0–8.5 cm long, 0.8–1.0 cm wide; all leaves flat, entire, only sometimes with occasional bristles along margin, acute or obtuse, glaucescent from fine arachnoid-hairy pubescence. Capitula 15–17 mm long at fruiting, on short, densely tomentose, 4–7 mm-long peduncles or terminal on branches, with 10–11 florets. Inner involucre bracts 13 mm long, usually densely, puberulent on the outer side, with or without bristles along midrib. Achene body 3.0–4.5 mm long, upper part with two or three rows of slightly erect, short scales, upper scales often three-lobed; crown of five, about 1 mm-long scales, usually three-lobed with longer middle lobe and indistinct lateral lobes; beak 2–5 mm long, slightly clavate

in the upper part; pappus 7–9 mm long. Flowering July to September. (Plate XXVII, Fig. 3).

Sandy steppes, pine forest glades, gravel-beds, rubbly and stony mountain slopes, up to 2,500–3,300 m, sometimes as weed in crop-fields.—*European Part*: Trans-Volga (southern part), Lower Volga; *Soviet Central Asia*: Aralo-Caspian (except southwestern part), Balkhash Region, Dzhungaria-Tarbagatai, Tien Shan, Syr-Darya, Pamiro-Alai (except Pamir); *Western Siberia*: Upper Tobol (southern Part), Irtysh (eastern part). *General distribution*: Iran-Afghanistan (Afghanistan). Described from Dzhungarian Alatau (Lepsa River). Type in Moscow; isotype in Leningrad.

Note. A large part of the specimens of this species in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad was identified as *C. juncea*. M.M. Iljin (1930) cited *C. canescens* among other synonyms of *C. juncea*. Another part of the herbarium specimens of *C. canescens* was assigned by Iljin to *C.*
 573 *gummifera*—a species established by him. The latter species was described from western Kazakhstan (Lake Baskunchak, Ryn-Peski) but, as can be judged from the authentic specimens, it is also found in eastern Kazakhstan and in the mountainous areas of Soviet Central Asia. A comparison of the type specimens of *C. canescens* and *C. gummifera* showed that they do not have differences of taxonomic significance (specimens of *C. gummifera* differ only by the absence of setaceous hairs along the midrib of the inner involucre bracts and, in some cases, by a somewhat larger size of the capitula). *C. bornmuelleri* Haeckel (1930), a species later described from Afghanistan, judging from the photograph of the type specimen and illustrated details, in my opinion also does not differ from *C. canescens*.

8. *C. gibbistrois* M. Pop. in Sprygin and Popov, Pochv. Issled. v Bass. Syr-Dari i Amu-Dari, 1 (1915) 50; O. and B. Fedtsch. Perech. Rast. Turk. VI (1916) 347; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 54.—*C. juncea* ssp. *canescens* f. *aculeolata* M. Pop. and Vved. ex Iljin, ibid, (1930) 52.

Perennial. Stem 60–150 cm high, up to 10 mm thick, strongly branched from the middle or above, glabrous, with thin virgate branches; setaceous hairs at the base of stem sparse and small, tomentose pubescence indistinct. Leaves of basal rosette indistinct; cauline leaves lanceolate, less often linear-lanceolate, (2)6–10 cm long, 0.5–1.0 cm wide, entire, sometimes with occasional bristles along margin, acute or obtuse, glabrous or with scattered arachnoid-hairy pubescence. Capitula 16–18 mm long at fruiting, on densely tomentose, 8 mm-long peduncles, or terminal on lateral branches. Inner involucre bracts 11–13 mm long, with dense and fine arachnoid-hairy pubescence on the outer side, sometimes with bristles

along midrib. Achene body 3.5–4.5 mm long, upper part with one or two (three) rows of indistinct small tubercles; crown of five undivided, ovate, small, 0.2–0.5 mm-long scales; beak 2–4 mm long, straight, slightly longer than, shorter (up to half as long) or as long as achene body, clavate in the upper part; pappus 6–8 mm long. Flowering June to August.

Stony slopes and gravel-beds, up to 1,800 m.—*Soviet Central Asia*: Tien Shan (Angren River valley), Pamiro-Alai (excluding Pamir): Endemic. Described from rocks along Vakhsh River. Type in Tashkent.

Section 2. *Arthrorhynchus* Fisch. and Mey. Ind. Sem. Hort. Petrop. VIII (1841) 54.—Stem with more or less dense white tomentum in the lower part and only sometimes with sparse setaceous hairs. Rosette of basal leaves absent. Achene body 3.0–4.5(5.5) mm long; beak slender, with distinct articulation.

Type of section: *C. piptocoma* Fisch. and Mey.

Note. Besides the species growing on the territory of the USSR, this section includes *C. setosa* Clarke from India (Baluchistan) and *C.*
574 *hookeriana* Iljin from the Karakorum Mountains. M.M. Iljin (1930, p. 37) also included in this section *C. insolens* Iljin—a species described by him from the upper reaches of the Angren River. I have not seen the type specimen of this species, and I cannot judge the systematic position of this species from the original description compiled from specimens lacking mature achenes.

Series 1. *Piptocomae* Leonova.—Articulation of beak of achenes at its base (directly above crown) or slightly above, but always much below the middle of beak, below or slightly above the upper margin of scales of crown.

9. ***C. piptocoma* Fisch. and Mey. Ind. Sem. Hort. Petrop. VIII (1841) 54; Ldb. Fl. Ross. III, 2, 808; Trautv. in Bull. Soc. Nat. Mosc. XXXIX, 2 (1866) 385; Krylov, Fl. Alt. III (1904) 744; Fl. Zap. Sib. XI, 3012; O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 323; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 34.**—*C. graminea* auct. non M.B.: Ldb. Fl. Alt. IV (1833) 148 excl. syn.—*C. rouillieri* auct. non Kar. and Kir. (1841): Kar. and Kir. in Bull. Soc. Nat. Mosc. XV, 2 (1842) 397.—*C. soongorica* Stschegl. in Bull. Soc. Nat. Mosc. XXVII, 1 (1854) 179.—*C. piptocoma* ssp. *soongorica* (Stschegl.) Iljin, op. cit. (1930) 36.—**lc.:** Ldb. Ic. Pl. Fl. Ross. II (1830) t. 177.

Perennial. Stem 35–80 cm high, 2–4 mm thick, densely or sparsely branched from the base, reddish in the lower part, with dense arachnoid-hairy pubescence, as also branches, with arachnoid-hairy pubescence above, less often glabrous. Lower cauline leaves oblong-obovate, runcinate,

or remotely toothed, 3.5–5.0 cm long, about 4 mm wide; other leaves linear-filiform to narrowly linear, 4–6(8) cm long, 0.5–1.0(2.0) mm wide, entire, acuminate with arachnoid-hairy pubescence, less often subglabrous. Capitula 11–13(14) mm long at fruiting, terminal on branches or on arachnoid-hairy pubescent, 0.4–1.5 cm-long peduncles, with 9–12-florets. Inner involucre bracts 9–12 mm long, with more or less dense arachnoid-hairy pubescence on the outer side, less often subglabrous, lighter in color. Achene body 3.25–4.5 mm long, with five-furrows and five-ribbed ridges, smooth, sometimes with few, very small scales in the upper part; crown of five short scales, incised into three narrow lobes of equal length; beak 0.75–1.0(1.5) mm long, thick, with articulation at the base of beak or slightly above (and then projecting above the upper margin of corona scales), clavate in the upper part; pappus 6–8 mm long. Flowering June to September.

Stony mountain slopes, gravel-beds, sandy banks of rivers and lakes.—*Soviet Central Asia*: Balkhash Region (Zaisan District, Lake Alakul), Dzhungaria-Tarbagatai (Tarbagatai, in Dzhungarian Alatau, only along Lepsa River); *Western Siberia*: Altai. *General distribution*: Dzhungaria-Kashgaria (Dzhungaria). Described from Altai. Type in Leningrad.

10. *C. lejosperma* Kar. and Kir. in Bull. Soc. Nat. Mosc. XIV, 3 (1841) 456; *ibid.* XV, 2 (1842) 397; Ldb. Fl. Ross. II, 2, 809; 575 Kovalevskaja in Fl. Uzb. VI, 453.—*C. lejosperma* var. *coronata* Iljin and var. *longirostris* Iljin in Bull. Otdel. Kauchukon. 3 (1930) 39.—*C. distincta* Iljin, *ibid.* (1930) 39, in syn.—*C. kareliniana* Iljin, *ibid.* (1930) 40, nomen.—*C. brevicollis* Iljin, *ibid.* (1930) 45, p. p. (quoad pl. tianschan.).—*C. coronifera* Iljin, *ibid.* (1930) 46.—*C. articulata* Rodin in Zhurn. Vses. Nauchno-Issl. Inst. Kauch. in Guttap. 5 (1932) 67; in Fedde, Repert. XXXIV (1933) 136.

Perennial. Stem (30)40–125 cm high, up to 7–8 mm thick, slightly reddish in the lower part, more or less densely arachnoid-hairy pubescent, sometimes with isolated setaceous hairs, not strongly branched above the base, less often almost from the base with glabrous or pubescent branches. Lower cauline leaves oblong or lanceolate, toothed or weakly runcinate, less often subentire, 3–10 cm long, 0.4–1.2 cm wide, glabrous or arachnoid-hairy pubescent; other leaves narrowly linear, oblong-linear to linear or lanceolate, (0.7)1.5–5.0(7.0) cm long, 1–2(5) mm wide, glaucescent, glabrous or arachnoid-hairy pubescent, entire. Capitula 13–16 mm long at fruiting, terminal on branches or on tomentose, 0.8–2.0 cm-long peduncles, with 11-florets. Inner involucre bracts 10–13 mm long, light, with dense arachnoid pubescence on the outer side, sometimes with bristles in the upper part or over the entire length of midrib. Achene

body 3.0–4.5(5.5) mm long, upper part with two (or three) rows of small scales and tubercles, uppermost scales much longer, three-lobed, deflected; corona of five, 0.2–0.5(0.7) mm-long, more or less deeply three-lobed scales, middle lobe often more distinct; beak 1.25–3.0(4.0) mm long with articulation slightly above the base of beak and the upper margin of crown scales with thicker and sulcate lower part; beak clavate in the upper part; pappus 5–8 mm long. Flowering May to September. (Plate XXVIII, Fig. 2).

Stony and rubbly mountain slopes, gravel-beds, sometimes as weed in crop fields.—*Soviet Central Asia*: Balkhash Region (near Panfilov, northern bank of Lake Balkhash), Dzhungaria-Tarbagatai, Tien Shan, Syrdarya, Pamiro-Alai (northern part). *General distribution*: Dzhungaria-Kashgaria (Dzhungaria), Mongolia (western part). Described from Tarbagatai (Taldy River). Type in Moscow; Isotype in Leningrad.

Note. 1. In the Altai Range (Taldyk, 7.VIII.1930, Nos. 1208 and 1214, S. Juzepczuk; near Gulcha along the bank of the Chigirchik River, 12.VIII.1930, No. 332, S. Juzepczuk) and in western Tien Shan (Chingan Mountains, along the bank of the Nurkat River, 9.IX.1940, O. Knorring, Chatkal, near Nazar, 3.VII.1899, D. Litwinow), we find plants distinguished by much longer corona scales (divided to base into three, narrow, approximate lobes) and possibly belonging to a separate race, which we tentatively name ssp. *longicoronata* Leonova ssp. nova.

Note. 2. In the synonymy of *C. lejosperma*, I have included the species *C. coronifera*, described by M.M. Iljin (1930) from the vicinity of Alma-Ata (from the Poganka River), on the basis that the type specimen of this species, as also the entire material assigned to it by M.M. Iljin, 576 does not possess significant differences from the type and authentic specimens of *C. lejosperma* preserved in the herbarium of the Botanical Institute, Academy of Sciences of the USSR in Leningrad. In my opinion, *C. articulata*, described by L.E. Rodin (1932, 1933) from Tien Shan, is a more recent synonym of *C. lejosperma*. According to the original description and illustrated details of *C. articulata*, the differences between this species and *C. lejosperma* lie in the sculpture of the achenes and the shape of the beak. However, the type and authentic specimens of *C. Articulata*, examined by me, do not show the achene characters reported by L.E. Rodin and, in my opinion, do not differ significantly from *C. lejosperma*.

11. *C. rouillieri* Kar. and Kir. in Bull. Soc. Nat. Mosc. XIV (1841) 456; Ldb. Fl. Ross. II, 2, 809; Krylov, Fl. Alt. III (1904) 744; Fl. Zap. Sib. XI, 3013; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 44; in Tr. po Prikl. Bot. XXIV, 3 (1930) 161.

Perennial. Stem 40–100 cm high, up to 5 mm thick, reddish in the lower part with arachnoid-hairy pubescence and sparse setaceous hairs, less often glabrous, branched above the base, less often almost from the base with slender, virgate, glabrous branches, sometimes sparsely pubescent only in inflorescence. Lower cauline leaves oblong-lanceolate; about 4 cm long and 2 mm wide, remotely toothed, with bristles on teeth and beneath along midrib; other leaves linear-filiform, 3.5–7.0 cm long, about 0.75 mm wide, glabrous, entire. Capitula 13–15 mm long at fruiting, terminal on branches, with 9–11 florets. Inner involucre bracts 10–13 mm long, light colored, densely arachnoid pubescent on the outer side, less often with isolated bristles along midrib in the upper part of bracts (specimens from Barnaul District). Achene body 3.5–4.0(5.0) mm long, upper part with two or three (sometimes more) rows of wide, erect scales and tubercles, uppermost scales sometimes three-lobed, less often scales undeveloped, crown of five, more or less smooth and narrow, oblong-linear, acuminate scales; beak 1.25–2.25 mm long, slender, with articulation in the lower part of beak, directly at its base, distinctly clavate in the upper part; pappus 6–7 mm long. Flowering June to August.

Ribbonlike pine forests, gravel-beds, sands of river valleys, often as weed in crop fields.—*Soviet Central Asia*: Balkhash Region (Ili River); *Western Siberia*: Irtysh (eastern part), Altai (southwestern part). Endemic. Described from Altai, from area between Pyanoyarsk and Ubinsk. Type in Moscow; isotype in Leningrad.

12. *C. laticoronata* Leonova in Addenda XXVIII, 754.

577 Perennial. Stem 35–100 cm high, with white tomentose arachnoid-hairy pubescence and less often with scattered setaceous hairs in the lower part, not strongly branched from the base, with slender, virgate, light green branches, glabrous or arachnoid-hairy pubescent, denser in inflorescence. Lower cauline leaves oblongly lanceolate, entire, or weakly and remotely erose, 3 cm long, 3–7 mm wide; other leaves small, narrowly linear, almost filiform, less often to lanceolate, 1.5–2.5(5.0) cm long, 0.5–1.0 (3.0) mm wide, glabrous or arachnoid-hairy pubescent, entire, Capitula 12–15 mm long at fruiting, terminal on branches or on tomentose, about 7 mm-long peduncles, with 9–11 florets. Inner involucre bracts 10–13 mm long, white tomentose on outer side, sometimes with isolated bristles along midrib. Achene body 3.5–4.5 mm long, upper part with one or two (three) rows of wide and short, erect scales, sometimes three-lobed; crown of five undivided and wide scales, truncate and erose or obtuse above, broadly spatulate; beak 1.0–2.5 mm long, with articulation in the lower part, above or below the upper margin of scales of crown, clavate in the upper part; pappus 6–7 mm long. Flowering July to September. (Plate XXVIII, Fig. 1).

Stony and sandy places in river valleys and shores of lakes.—*Soviet Central Asia*: Balkhash Region (northern shore of Lake Balkhash, vicinity of Panfilov, Khorgos River), Tien Shan (vicinity of Alma-Ata, Tersk Alatau Range, Ketmen Range), Pamiro-Alai (Alai Range); *Western Siberia*: Irtysh (vicinity of Semipalatinsk). *General distribution*: Dzhungaria-Kashgaria (Dzhair Range). Described from vicinity of Alma-Ata (vicinity of Vernego, 15.IX.1885, and 10.VIII.1887, Yu. Killoman). Type in Leningrad.

Series 2. Phaeocephalae Leonova.—Articulation of beak of achenes near the middle or slightly below it, less often above the middle, always much above the margin of scales of crown.

13. **C. phaeocephala** Rupr. in Mém. Acad. Pétersb. XIV, 4 (1869) 59; Trautv. in Tr. Peterb. Bot. Sada, VIII, 2 (1823) 523; O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 323; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 40.—*C. ambigua* var. *setosa* O. Fedtsch. in Tr. Peterb. Bot. Sada, XXVIII, 1 (1908) 36.—*C. maracandica* f. *setosa* (O. Fedtsch.) Iljin, op. cit. (1930) 41.—*C. lejosperma* auct. non Kar. and Kir.: Iljin, op. cit. (1930) 38.—*C. brevicollis* Iljin op. cit. (1930) 45 p. p. (quoad pl. alatae).—**lc.**: Iljin in Tr. Prikl. Bot. XXIV, 3 (1930) 162, Fig. 8.

Perennial. Stem 30–80 cm high, slightly reddish, in the lower part, glabrous or arachnoid-hairy pubescent and with dense, short setaceous hairs, latter occasionally also on branches, reaching inflorescence, strongly branched from base, with slender, virgate branches, less leafy, glabrous or arachnoid-hairy pubescent. Lower cauline leaves oblong-spatulate or oblong, about 4.0–4.5 cm long, 2–10 mm wide, weakly runcinate or remotely toothed, sometimes subentire, with bristles on margin in the lower part and beneath along midrib; other leaves narrow, oblong-linear, linear, sometimes almost filiform, about 2–4(6) cm long and 1.5 mm
578 wide, entire, glabrous or arachnoid-hairy pubescent sometimes with isolated bristles along margin. Capitula 12–15 mm long at fruiting, terminal on branches or on densely tomentose, 2–10 mm-long peduncles, with 10–12 florets. Inner involucre bracts 8–12 mm long, dark green, sometimes almost black, more or less densely arachnoid-hairy pubescent on the outer side; with long blackish bristles over the entire length of midrib or only in its upper part, or bristles absent. Achene body 3–4.5(5) mm long, absolutely smooth or with isolated small tubercles in the upper part; crown of five smooth or three-lobed scales, often with larger and obtuse middle lobe, crown sometimes undeveloped or absent; beak 0.75–2.25 mm long, with distinct articulation in middle or slightly below, with constriction at the site of articulation and with cupuliform and ribbed lower part, clavate in the upper part; pappus 6–7 mm long. Flowering June to September. (Plate XXXVIII, Fig. 3).

Talus, gravelly and sandy places in river valleys, stony slopes up to 4,000 m.—*Soviet Central Asia*: Tien Shan, Pamiro-Alai (eastern part). *General distribution*: Dzhungaria-Kashgaria. Described from Tien Shan. Type in Leningrad.

Note. One of the very high-mountain species of the genus, apparently growing also in Afghanistan and Pakistan regions bordering Tadzhikistan.

14. *C. maracandica* Bge. Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As. i.e. Lehmann reliq. bot. etc. (1851) 104 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 380; Boiss. Fl. or. III, 792; Trautv. in Tr. Peterb. Bot. Sada, VIII, 2 (1883) 522; O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 323; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 40.

Perennial. Stem 25–70 cm high, up to 4 mm thick, reddish-violet in the lower part with arachnoid-hairy pubescence, strongly branched from the base with slender, virgate, light green, glabrous branches, arachnoid-hairy pubescent only in inflorescence. Lower cauline leaves oblong or oblong-linear, 0.8–3.5(8.0) cm long and 2–3(4) mm wide, remotely toothed, less often entire; other leaves filiform, coriaceous and small, 0.2–1.5(2.5) cm long and about 1 mm wide, entire, glabrous. Capitula 12–13 mm long at fruiting, terminal on branches or on arachnoid-hairy pubescent, 7 mm-long peduncles. Inner involucre bracts 10–12 mm long, light colored, with dense, finely arachnoid-hairy pubescence on the outer side, sometimes with black bristles in the upper part of bracts along midrib. Achene body 4.5–5.0 mm long, upper part with small, acute, scales and tubercles, forming undeveloped crown or with indistinct tubercles not forming crown; beak short, 0.75–1.0 mm long, with articulation in the middle or above, with constriction at the site of articulation and with lower cupulate and ribbed part, clavate in the upper part; pappus 7–8 mm long. Flowering June to September.

579 Stony slopes, gravelly and sandy places in river valleys.—*Soviet Central Asia*: Pamiro-Alai (Zeravshan Valley). Endemic. Described from Zeravshan River. Type in Pais; isotype in Leningrad.

Note. Judging from the type specimen examined by me, which did not have mature achenes, this species is very similar to *C. phaeocephala*. With some reservation, I am referring two other specimens with mature achenes from the Zeravshan River Valley to it, which differ somewhat from *C. phaeocephala*. However, I am not entirely convinced of the identity to these latter specimens with the type specimen of *C. maracandica*.

15. *C. ornata* Iljin in Byull. Otdel. Kauchukon. 3 (1940) 43; Tr. po. Prikl. Bot. XXIV, 3 (1930) 184.

Perennial. Stem 30–50 cm high, up to 4 mm thick, with thin

arachnoid-hairy pubescence in the lower part; branched from the base with yellowish-green, glabrous, virgate branches. Lower cauline leaves oblong or oblong-linear, toothed with bristles on teeth and beneath along midrib, withering by anthesis; other leaves linear-filiform, 0.8–3.0 cm long, about 1 mm wide, glabrous, entire. Capitula 15–16 mm long at fruiting, terminal on branches, mostly with 11 florets. Inner involucre bracts 13–14 mm long, dark green, with scattered arachnoid pubescence on the outer side. Achene body large, 5.0–5.5 mm long, upper part with one row of wide and short, deflected scales, below with one or two rows of smaller, isolated, tubercles and scales; crown of five, wide, smooth, obtuse, or weakly obtuse three-lobed scales; beak 0.75–1.0 mm long, thick with indistinct articulation in the middle or slightly below, with cupulate and ribbed lower part, scarcely clavate in the upper part; pappus 7–8 mm long. Flowering July to September.

Gravel-beds.—*Soviet Central Asia*: Tien Shan (Lake Issyk-Kul). Described from area of Lake Issyk-Kul. Type in Leningrad.

Note. I had at my disposal only the one (type) specimen of this species cited by M.M. Iljin in the original description: "Along the road from the village of Chompanalata to the village of Grigorevka, along a stream entering Lake Issyk-Kul, gravel-bed, 1.X.1929, No. 49, M.M. Iljin and V.A. Poddubnaya." An examination of this specimen revealed that with respect to such characters as the color of the plants, large size of the capitula and the achene body, and shape of the beak, this species is considerably closer to the members of section *Pachyrhynchus*. However, the presence of indistinct articulation forces me to place this species in section *Arthrorhynchus*.

Section 3. *Pachyrhynchus* Leonova in Addenda XXVIII, 754.—Stem with white tomentum and scattered setaceous hairs in the lower part. Rosette of basal leaves withering by anthesis, persistent (2). Achene
580 body 5–7 mm long; beak thick, only slightly narrower than body of achene, branched in the lower part, without traces of articulation, not fragile.

Type of section: *C. kusnezovii* Iljin.

A monotypic section.

16. *C. kusnezovii* Iljin in Byull. Otdel. Kauchukon. 3 (1930) 30; in Sb. Kauchuk i Kauchukon. II (1953) 606; Igolkin and Zapryagaev in Sov. Bot. 6 (1935) 88.

Perennial. Stem 60–100 cm high, up to 10 mm thick, slightly reddish with arachnoid hairy pubescence and scattered setaceous hairs in the lower part, sometimes rising rather high, branched from the base, with glabrous, matte branches pubescent only at their bases, denser in inflorescence.

Lower cauline leaves runcinate, sometimes subentire, 6–9 cm long, 3–10 mm wide, glabrous, with bristles beneath on midrib; other leaves lanceolate or linearly lanceolate, less often to linear, 0.8–6.5 cm long, 1–4 mm wide, entire, glabrous or arachnoid-hairy pubescent. Capitula 14–16 mm long at fruiting, terminal on densely arachnoid hairy pubescent branches or on 5–7 mm-long peduncles, with 9–11 florets. Inner involuclral bracts (seven) eight(nine) 10–12 mm long, with dense tomentose pubescence on the outer side, with one to three bristles in the upper part of midrib; achene body 5–7 mm long, upper part with one or to rows of indistinct scales or tubercles, crown of five short oblong-ovate, undivided scales, acute or obtuse, sometimes with small lateral lobes in the lower part of scales; beak 0.8–1.25 mm long, thick, clavate above, broadened in the lower part, without traces of articulation; pappus 7–8 mm long. Flowering June to September.

More or less hummocky sands, gravel-beds.—*Soviet Central Asia*: Balkhash Region (southern edge of Muyunkum sands and adjoining northern foothill slope of Kirghiz Range; at 1,080 m). Endemic. Described from Muyunkum sands. Type in Leningrad.

Subgenus 2. Brachyrhynchus (Iljin) Leonova comb. nova.—sect. *Brachyrhynchus* Iljin in Byull. Otdel. Kauchukon. 3 (1930) 14, 19.—Inner involuclral bracts five (six or seven), always without bristles along midrib. Capitulum with five (six or seven) florets.

Lectotype of subgenus: *C. ambigua* Fisch. ex Kar. and Kir.

Series 1. Ambiguae Leonova.—Achene body without crown or with scarcely visible crown of sparse, small scales or tubercles. Inner involuclral bracts and florets in capitulum always five.

17. *C. ambigua* Fisch. ex Kar. and Kir. in Bull. Soc. Nat. Mosc. XV (1842) 398; Ldb. Fl. Ross. III, 2, 809; O. and B. Fedtsch. Perech. Rast. 581 Turk. III (1909) 322; Pavlov, Fl. Tsent. Kazakhst. III (1938) 351; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 22; in Fl. Yugo-Vost. VI, 455; in Sb. Kauchuk i Kauchukon. III (1953) 601; in Fl. Turkm. VII (1930) 314; Krylov, Fl. Zap. Sib. XI, 3010; Kovalevskaya in Fl. Uzb. VI, 453.—*C. juncea* c. *ambigua* (Fisch. ex Kar. and Kir.) Schmalh. Fl. II (1897) 149.—*C. ambigua* f. *crassicola* Iljin, op. cit. (1930) 23 quoad descr.

Perennial. Stem (30)40–100 cm high, up to 6–10 mm thick, glabrous, sometimes reddish-violet in the lower part, densely and spreadingly branched from base, less often slightly above; branches glabrous, slender, light green, densely and divaricately branched. Lower cauline leaves linear-lanceolate, or lanceolate, entire, only sometimes with isolated teeth, 3–7 cm long, about 2–5 mm wide; other leaves narrowly lanceolate to linear-lanceolate, 0.5–7.0 cm long and about 1.0–1.5 mm wide, entire, glabrous.

Capitula (11)13–18 mm long at fruiting, on tomentose peduncles or terminal on branches, with five florets. Inner involucre bracts five, 10–14 mm long, glabrous or scatteredly short arachnoid pubescent on the outer side, denser in the lower part, green or yellowish-green. Achene body 5.2–7.0(8.5) mm long, with five furrows, without scales and crown or with scarcely visible tubercles or scales in the upper part forming a crown; beak 0.1–0.3(0.5) mm long, narrowed in the upper part; pappus 6–10 mm long. Flowering May to September.

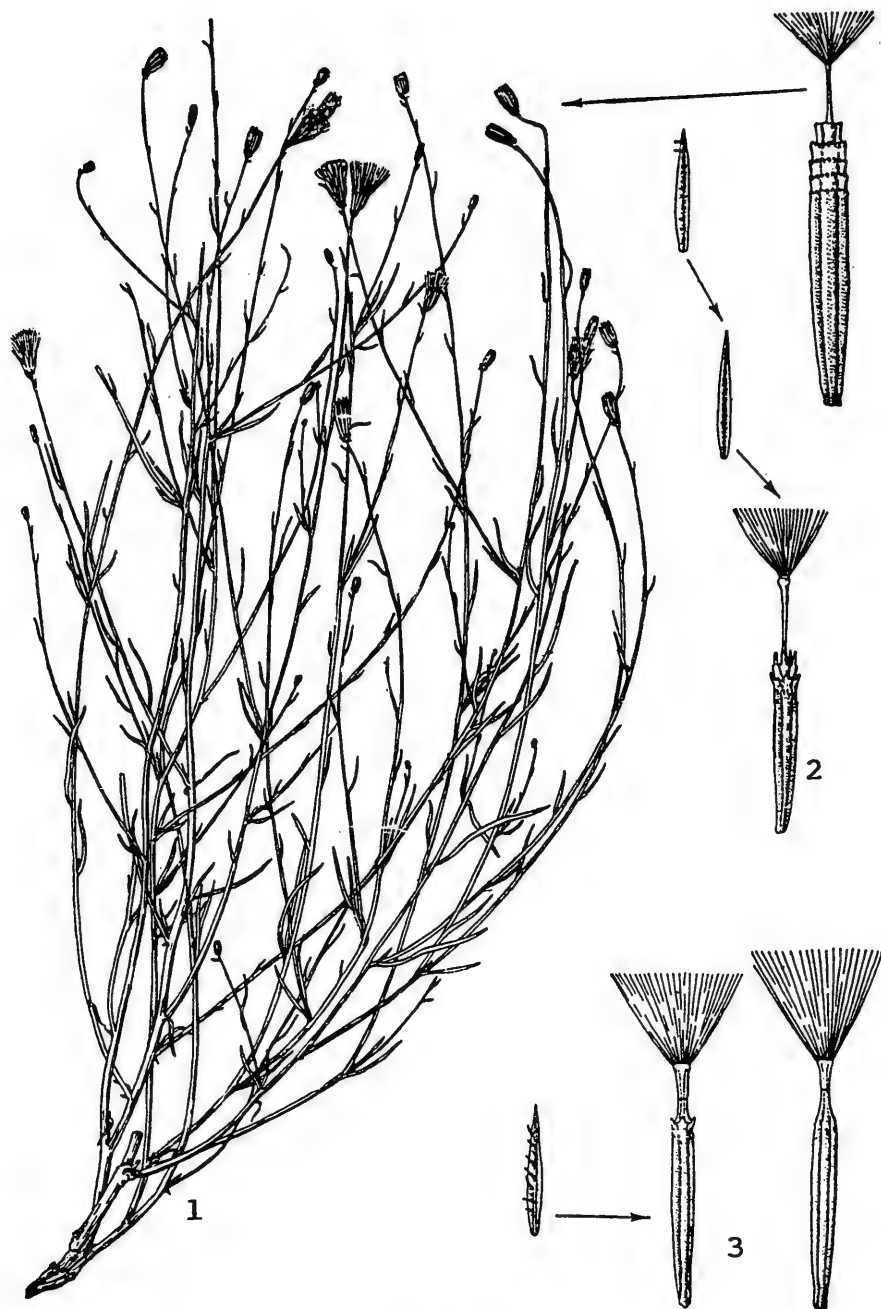
Shifting and partly overgrown hummocky sands and edges of sands.—*European Part*: Lower Volga (southern part); *Soviet Central Asia*: Aralo-Caspian, Balkhash Region; *Western Siberia*: Upper Tobol (western part), Irtysh (vicinity of Semipalatinsk), Altai (Chuya River). *General distribution*: (?) Dzhungaria-Kashgaria. Described from Soviet Central Asia, from Lepsa River. Type in Leningrad.

18. **C. macrocarpa** Leonova in Addenda XXVIII, 754.—*C. ambigua* f. *crassicola* Iljin in Byull. Otdel. Kauchukon. 3 (1930) 23 quoad ic., descr. excl.

Perennial. Stem 80–120 cm high, 4–7 mm thick, branched above the base with thick, flexuous, densely divaricately branched, glabrous or scatteredly pubescent branches (densely pubescent in inflorescence). Lower and middle cauline leaves runcinately or weakly runcinate, with one to three teeth on each side, 0.5–5.5 cm long, 2.0–2.5 mm wide; other leaves linear-lanceolate or lanceolate, entire, 0.5–4.0 long, 0.5–2.0 mm wide, glabrous or scatteredly pubescent. Capitula 18–20 mm long at fruiting, terminal on densely arachnoid-hairy pubescent branches, with five florets. Inner involucre bracts five, 13–15 mm long, pubescent on the outer side all over or only in the lower part. Achene body (6.5)8.0–11.0 mm long, without scales or with isolated fine tubercles in the upper part; crown absent or only noticeable as individual fine tubercles and scales; beak (0.2)0.5–1.5 mm long, clavate in the upper part; beak (0.2)0.5–1.5 mm
582 long, clavate in the upper part; pappus 8–9 mm long. Flowering June to September. (Plate XXIX, Fig. 1).

Hummocky, somewhat broken sands.—*Soviet Central Asia*: Kyzyl-Kum (Karakalpak ASSR), Aralo-Caspian (Sarysu River), Balkhash Region (western edge of Muyankum sands). Endemic. Described from Karakalpak ASSR. Type (Karakalpak Kyzyl-Kum, Kuldar, hummocky somewhat broken sands, 20.IX.1932, Muravlyanskii) in Leningrad.

Series 2. Pauciflorae Leonova.— Achene body usually with distinct corona, with scales and tubercles in the upper part. Inner involucre bracts five or six (seven), and five or six (seven or eight) florets in capitulum on the plant.



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Plate XXVIII.

1 — *C. laticoronata* Leonova; 2—*C. leiosperma* Kar. and Kir.; 3—*C. phaeocephala* Rupr.

19. **C. pauciflorae** Ldb. Fl. Alt. IV (1833) 148; Fl. Ross. II, 2, 810; DC. Prodr. VII, 1, 142; Boiss. Fl. or. III, 793, excl. syn.; O. and B. Fedtsch. Perech. Rast. Turk. III (1909) 323; Iljin in Byull. Otdel. Kauchukon. 3 (1930) 24; in Fl. Yugo-Vost. VI, 455, 456; in Sb. Kauchuk i Kauchukon. II (1953) 603; Pavlov, Fl. Tsentr. Kazakhst. III (1938) 351; Krylov, Fl. Zap. Sib. XI, 3011.—*C. kossinskyi* Iljin, op. cit. (1930) 24.—*C. squamata* Iljin, op. cit. (1930) 27.—*C. thoracifera* Iljin, op. cit. (1930) 28.—*C. sajsanensis* Iljin, op. cit. (1930) 29.—**lc.**: Ldb. Ic. pl. Ross. II (1830) t. 198.

Perennial. Stem 40–100 cm high, up to 6–10 mm thick, glabrous, reddish-violet in the lower part, sometimes with scattered tubercles or bristles and scattered arachnoid-hairy pubescence, branched above the base or from the base with slender, glabrous, divaricate branches arachnoid pubescent only in inflorescence. Lower cauline leaves lanceolate, weakly erose, 7.5–8.5 cm long and about 1 cm wide, glabrous; other leaves narrowly linear to lanceolate, (0.3)0.5–2.5(4.0) cm long, 0.3–1.5 mm wide, entire, glabrous. Capitula 15–17(20) mm long at fruiting, terminal on tomentose tips of branches or on peduncles, with five (less often six or seven), florets. Inner involucre bracts five (less often six or seven), 11–14(15) mm long, arachnoid pubescent on the outer side, denser in the lower part, less often glabrous in the upper part. Achene body 5–7(8) mm long, upper part with one or two (three) rows of erect scales, less often without them; crown of five, deeply three-lobed, short scales with lobes of almost equal length (in individual achene scales reduced to fine tubercles); beak (0.25)0.5–1.5(2.0) mm long, thinner than achenes, clavate in the upper part; pappus 7–9 mm long. Flowering May to September.

Hummocky, stabilized sands and edges of sands, sandy steppes.—*European Part*: Lower Volga; *Soviet Central Asia*: Aralo-Caspian; 584 *Balkhash Region*; *Western Siberia*: Irtysh (vicinity of Semipalatinsk), Altai (southwestern part). *General distribution*: ?Dzhungaria-Kashgaria. Described from Altai. Type in Leningrad.

Note. The species *C. kossinskyi*, *C. squamata*, *C. thoracifera* and *C. sajsanensis*, cited in synonymy, according to the type and authentic specimens as well as original descriptions, in my opinion do not differ significantly from *C. pauciflora*. All these species have achenes with identical sculpture, shape of scales of corona and almost identical beak size.

20. **C. macra** Iljin in Byull. Otdel. Kauchukon. 3 (1930) 26.

Perennial. Stem about 100 cm high, glabrous, divaricately branched from the base, branches light green, glabrous, with not dense arachnoid-hairy pubescence only at the base and in inflorescence. Culine leaves lanceolate to linear, 0.5–5.0 cm long, about 1.0–1.5 mm wide, entire,

glabrous. Capitula 15 mm long at fruiting, terminal on branches, with five florets. Inner involucre bracts five, 13–15 mm long, with scattered short arachnoid-hairy pubescence on the outer side, more dense in the lower part. Achene body 6–6.5 mm long, upper part with one or two rows of fine tubercles and scales; crown of five undivided, ovate, fine scales; beak 0.5–0.7 mm long, clavate in the upper part; pappus 8–9 mm long. Flowering June to September(?).

More or less deflated sands.—*Soviet Central Asia*: Balkhash Region (along the Sarysu River; Muyunkum sands). Endemic. Described from Muyunkum sands. Type in Leningrad.

21. **C. mujunkumensis** Iljin and Iolk. in Addenda, 755; in *Sov. Bot.* 6 (1935) 86, nomen; Iljin in *Sb. Kauchuk i Kauchukon.* II (1953) 609, diagn. in Russian.

Perennial. Stem 75–120 cm high, 5–9 mm thick, sometimes reddish in the lower part with scattered short setaceous hairs, branched from the base or slightly above with stiff, light green, glabrous branches, densely arachnoid-hairy pubescent only on inflorescence branches. Lower cauline leaves linear-lanceolate, entire or with small teeth, sometimes almost runcinate, about 7 cm long and 4 mm wide, glabrous, with isolated individual bristles beneath along midrib; other leaves linear or lanceolate, 0.8–4.5 cm long, 1.0–1.25 mm wide, entire, with one to three bristles on each side in the lower part, sometimes with isolated bristles along entire margin and beneath along midrib, glabrous or scatteredly arachnoid-hairy pubescent. Capitula 12–16 mm long at fruiting, terminal on densely tomentose tips of branches or on 5–7 mm long peduncles, with five or six (seven or eight) florets. Inner involucre bracts five or six (seven), 10–13 mm long, with rather dense arachnoid-hairy pubescence on the outer side. Achene body 4.5–6.0 mm long, upper part with one row of three-lobed, erect short scales and one row of fine tubercles; crown of five wide and short, about 0.3 mm long, three-lobed scales with larger
585 middle lobe (some scales spatulate, undivided and obtuse deltoid); beak 0.5–1.0 mm long, clavate in the upper part; pappus 6–8 mm long. Flowering June to September.

Sandy ridges.—*Soviet Central Asia*: Balkhash Region (southern edge of Muyunkum sands), not far from settlement of Akyrtoĭe). Endemic. Described from Muyunkum sands. Currently type is lost; neotype (Muyunkum sands, 5 km from settlement of Akyrtoĭe, 2.VI. 1930, No. 199, G. Iolkina) in Leningrad.

22. **C. bosseana** Iljin in *Byull. Otdel. Kauchukon.* 3 (1930) 26.—*C. cyanorostris* Iljin and Iolk. in *Sov. Bot.* 6 (1935) 85, nomen; Iljin in *Sb. Kauchuk i Kauchukon.* II (1953) 604; diagn. in Russian.—*C. cyanorostris* var. *zapragaevis* Iljin and Iolk. op. cit. (1935) 86, nomen.—*C. arenicola*

Iljin and Igolk. op. cit. (1935) 86, nomen.—*C. iljinii* Igolk. and Zapr. op. cit. (1935) 85, nomen; Iljin, op. cit. (1953) 605, diagn. in Russian.—?*C. sandybaica* Iljin and Zapr. op. cit. (1935) 86, nomen.

Perennial. Stem 100–150 cm high, up to 10–12 mm thick, sometimes reddish-violet and with not dense arachnoid pubescence in the lower part, closely but scatteredly branched from the base and slightly above, branches rather thick, light green, arachnoid-hairy pubescent, especially dense in inflorescence. Lower cauline leaves linear to linear-lanceolate, about 8–9 cm long, 3–7 mm wide with isolated or rather frequent teeth, glabrous or scatteredly arachnoid-hairy pubescent; other leaves linear-lanceolate to linear, 0.5–8.5 cm long and 0.5–7.0 mm wide, entire, light green. Capitula 17–18 mm long at fruiting, terminal on densely tomentose branches, with five or six (seven or eight) florets. Inner involucre bracts five or six (seven), 11–13 mm long, rather densely tomentose on the outer side. Achene body 0.6 mm long, upper part with one row of scales divided to the base into three lobes or tubercles, sometimes with second row of shorter tubercles; crown of five, 0.5–1.0 mm long, scales divided almost to the base into three, narrow, acuminate lobes, lateral lobes shorter and narrower than middle ones (sometimes considerably) and at base of middle lobe isolated scales undivided, without distinct lateral lobes; beak (1.0) 1.25–1.75 mm long, narrower than achene body, clavate in upper part; pappus 8–9 mm long. Flowering June to September.

Hummocky sands.—*Soviet Central Asia*: Balkhash Region (southern edge of Muyunkum sands). Endemic. Described from Muyunkum sands. Currently, type is lost; neotype (Muyunkum sands, 5–6 km from Akyrtoke settlement, hummocky-riding sands, 22.IX.1930, No. 559, G. Igolkin) in Leningrad.

Note. A study of the material of *C. cyanorostris* and *C. arenicola* at my disposal, identified by M.M. Iljin and G.I. Igolkin, does not permit the recognition of any significant differences whatsoever between them and the original diagnosis of *C. bosseana*, described earlier. The type specimens of *C. iljinii* and *C. sandybaica* are also lost at present. Based on the original description of *C. iljinii* and given that both these species, according to Igolkin and Zapryagaev (*Sov. Bot.* 6, 1935), grow in the same areas of the Muyunkum sands under identical ecological conditions and are very similar to each other, I tentatively place them in synonymy under *C. bosseana*.

Species of Uncertain Affinity

1. *C. hispida* (pall.) Poir. in *Encycl. meth. Suppl.* II (1811) 328.—*Prenanthes ?hispida* Pall. *Reise*, I (1771) 501.

The Herbarium of the Botanical Institute of the Academy of Sciences of the USSR contains Pallas' specimens with the label "Tatischschewo infra Orenburg," which, apparently, are the type specimens of this species. Judging from these specimens, *C. hispida* somewhat resembles *C. acantholepis* (from section *Chondrilla*), in the shape of the leaves and the presence of bristles on the leaves, branches and inner involucre bracts, which in our country grows in Crimea, Transcaucasia and mountainous Turkmenia. However, *C. hispida* differs from the latter species by the shorter achene beak, broader leaves, and larger number of bristles on the leaves and branches. Because of the absence of mature achenes, I cannot precisely determine the position of *C. hispida* in the system of the genus *Chondrilla* and also conclusively resolve the question of the identity of this species.

GENUS 1969. *Willemetia* Neck.^{1, 2}

Neck. Elem. bot. gen. I (1790) 50.

Capitula solitary terminal on leafless stem, with numerous bisexual ligulate florets. Involucre campanulate, 10–15 mm long, 10–14 mm wide; involucre bracts numerous, imbricate, coriaceous-herbaceous, lanceolate, acuminate, scarious along margin, ciliate near the apex, with more or less dense, long blackish hairs on the outer side along midrib, outer bracts 4–8 mm long, inner 10–15 mm long. Receptacle flat, glabrous. Corolla yellow, with long glabrous tube and five-toothed limb. Stamen filaments glabrous; anthers with short, scaly, narrow, basal appendage. Style bifid; style branches long, densely papillate. Achenes all alike, with long, slender beak and pappus of numerous bristles of same length, in turn covered with short (visible only at high magnification) and sparse secondary bristles; achene body 2.0–2.5 mm long, narrowly cylindrical, with five longitudinal ribs, covered over entire length with tubercular scaly processes; crown of five, undivided, wide scales; beak absolutely smooth, without articulation at the base. Perennial herbs with one (to three) simple leafless stems, terminating in single capitulum; leaves of basal rosette lyrate-pinnatipartite.

587 Lectotype of genus: *W. stipitata* (Jacq.) Cass.

This genus includes two species, one of which—*W. stipitata* (Jacq.) Cass.—is found in Central Europe in the countries of the Mediterranean, while the other—*W. tuberosa*—grows in the Caucasus and northern Iran.

¹ Treatment by T.G. Leonova.

² Named in honor of the 18th century French botanist Pierre Remi Francois de Paule Willemet.

1. **W. tuberosa** Fisch. and Mey. ex DC. Prodr. VII (1838) 150; Hohenacker, Enum. Pl. Talysh. (1838) 42; Boiss. Fl. or. III, 795; Grossh. Fl. Kavk. IV, 244 and Oprod. Rast. Kavk. (1949) 512; Aliiev in Fl. Azerb. VIII, 534.

Perennial. Rhizome slender, creeping, tuberculately thickened at places. Stem 10–50(60) cm high, 2–3 mm thick in the lower part, simple, leafless, glabrous or scatteredly hairy. Leaves of basal rosette 2.5–25.0 cm long (including petiole), 1–6 cm wide, thin, glabrous above, with scattered hairs beneath, lyrate pinnatifid with rather large, 3.0–6.5 cm long, cordate, obtuse, sinuate-toothed, terminal lobe and one to three(five) pairs of smaller, oblong, obtuse, more or less deflexed lateral lobes, reducing toward leaf base; petiole 1.5–8.0 cm long, glabrous or scatteredly hairy, broadened at the base. Capitula 2 cm long and 1.0–1.5 cm wide at fruiting, solitary. Outer involucral bracts 4–8 mm long, with long blackish hairs over entire length of midrib, denser in the lower part of bract; inner bracts 10–15 mm long, with occasional blackish hairs along midrib, denser in the upper part of bracts. Achene body 2–2.5 mm long, crown of five short, about 2 mm long, thickish scales rounded at the apex; beak 13 mm long, slender, with small (0.5 mm long) ribbed thickening in the lower part; pappus 6 mm long. Flowering (March) April to June. (Plate XXIX, Fig. 2).

Forests and scrublands, forest glades, plains and lower mountain zone, sometimes as weed in gardens.—*Caucasus*: Dagestan, Eastern Transcaucasia, Talysh. *General distribution*: Iran (northwestern part). Described from vicinity of Lenkoran. Type in Leningrad.

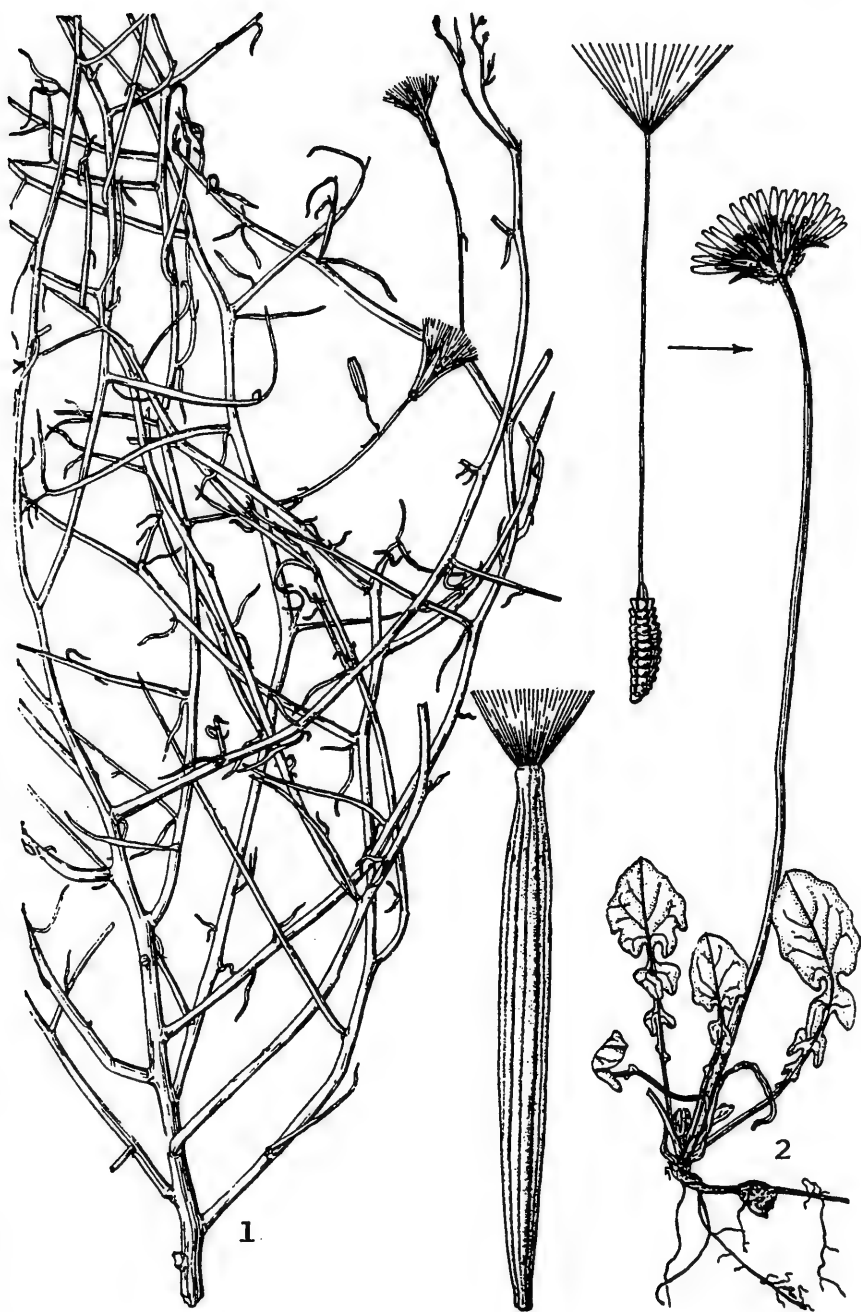
GENUS 1670. **Heteroderis** (Bge.) Boiss.^{1, 2}

Boiss. Fl. or. III (1875) 703.—*Barkhausia* sect. *Heteroderis* Bge. Beitr. z. Kenntn. Fl. Russl. u Stepp. Centr.-As. i. e., Lehman reliq. bot. etc. (851) 208 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 384.

Capitula clustered in three to five, terminal on stem and its lateral branches, with rather numerous bisexual ligulate florets. Involucre cylindrical, 8–13 mm long, 3–5 mm wide; involucral bracts coriaceous-herbaceous, arachnoid-hairy pubescent on the outer side or glabrous, with setaceous hairs often on midrib, scarious along margin; outer bracts five, ovate or lanceolate, small, 1.5–4.0 mm long, inner bracts eight, lanceolate-linear, 8–13 mm long. Receptacle flat, glabrous. Corolla yellow; tube

¹ Treatment by T.G. Leonova.

² From the Greek words *heteros*—different, and *dere*—neck; so named because of the absence of a beak on the peripheral achenes.



long, covered with very short erect hairs and with five-toothed limb. Stamen with glabrous filaments; anthers with short scaly narrow appendage at the base. Style long, bifid; style branches long, densely papillate. Achenes dissimilar; peripheral achenes eight, appressed to inner involucre bracts, without beak (less often isolated achenes with 1–2 mm long beak), curved, narrowed above, with five longitudinal ribs, without scales and tubercles; pappus of fewer, more or less equally long, bristles; central achenes numerous, with more or less long, slender beak and pappus of numerous equally long bristles, in turn covered with very short secondary bristles visible only at high magnification; achene body 2.5–3.0 mm long and about 0.5 mm wide, narrowly cylindrical, narrowed toward the base, with five longitudinal ribs, covered with small acute tubercles in the upper part or over entire length (often only on one to three ribs), gradually modified in the upper part to deflected acute scales; beak 2–7 mm long, absolutely smooth, without articulation at the base. Annual herbs with simple or branched, weakly leafy, erect or ascending stems, covered with more or less profuse, arachnoid-hairy or tomentose pubescence and setaceous hairs; cauline leaves alternate, sessile, amplexicaul, uppermost undivided and entire, middle and lower cauline leaves and leaves of basal rosette usually sinuate-toothed, less often runcinately pinnatipartite or pinnatilobate.

Lectotype of genus: *H. pusilla* (Boiss.) Boiss.

This genus includes four species, two of which are found in the USSR. Of the other two species, *H. stocksiana* Boiss. grows in southern Iran (Baluchistan) and *H. aegyptiaca* Schweinf. in the United Arab Republic.

1. Inner involucre bracts with arachnoid-hairy pubescence and setaceous hairs on the outer side 2. ***H. leucocephala*** (Bge.) Leonova
- + Inner involucre bracts with only setaceous hairs on the outer side, arachnoid-hairy pubescence absent 1. ***H. pusilla*** (Boiss.) Boiss.

1. ***H. pusilla*** (Boiss.) Boiss. Fl. or. III (1875) 794, p. p; Nikitin in Fl. Turkm. VII, 312; Kovalevskaya in Fl. Uzb. VI, 449, p. p.—*Chondrilla pusilla* Boiss. Diagn. pl. or. ser. 1, VII (1846) 11.—*Barkhausia chaetocephala* Bge. Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As. i. e. Lehm. reliq. bot. etc. (1851) 208 (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 384.—*B. melanocephala* Bge. op. cit. 209 and 385.

Annual. Stem 3–40 cm high, 1–3 mm thick at base, with more or less dense long setaceous hairs and not so dense arachnoid pubescence

all-over, less often subglabrous. Leaves of basal rosette obovate-oblong, sinuate-toothed or runcinately pinnatipartite, (1.7)3.0–8.0 cm long, (0.5) 1.0–2.0 cm wide, narrowed toward the base into petiole, glabrous, often with setaceous hairs beneath along midrib, spiny along margin; cauline leaves 3–8 cm long, 1.7–2.5 cm wide, with rather large incised auricles at the base, glabrous, less often sparsely arachnoid-hairy pubescent, with more or less dense setaceous hairs beneath along midrib; lower and middle leaves similar to basal; upper ones smaller, undivided, lanceolate or linear. Capitula 12–14 mm long, 4–5 mm wide at fruiting, clustered in small number, less often solitary, terminal on stem and its lateral branches. Outer involucre bracts broadly ovate, (1.5)2.5–4.0 mm long, about 2 mm wide, acuminate or attenuated, glabrous on the outer side, sometimes with setaceous hairs along midrib; inner bracts 8–12 mm long, without arachnoid-hairy pubescent on the outer side, keeled along midrib, with two rows of dense long setaceous hairs or setaceous hairs over entire surface of inner bracts except the narrow scarious margin. Peripheral achenes 3.5–4.5 mm long, densely papillose over entire length. Body of central achenes 2.5–3.0 mm long; beak 4–5 mm long; pappus 3.0–3.5 mm long. Flowering April to May (June).

Dry sandy and clayey slopes, alkali soils, Grass-beds in plains and foothills, often as weed by roadsides and near dwellings.—*Soviet Central Asia*: Aralo-Caspian, Balkhash Region, Kara-Kum, Kyzyl-Kum, Syr-Darya Pamiro-Alai (western part), mountainous Turkmenia. *General distribution*: Iran. Described from southern Iran. Type in Geneva.

2. *H. leucocephala* (Bge.) Leonova comb. nova.—*H. pusilla* Boiss. Fl. or. III (1875) 794, p. p.; Kovalevskaya in Fl. Uzb. VI, 449, p. p.—*Barkhausia leucocephala* Bge. Beitr. z. Kenntn. Fl. Russl. u. Stepp. Centr.-As., i. e., Lehman reliq. bot. etc. (1851) (seorsum impressum) and in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 385.

Annual. Stem 3–35 cm high, 1–2 mm thick at the base, with more or less dense arachnoid-hairy or sometimes tomentose pubescence and long setaceous hairs all-over, less often without hairs. leaves of basal rosette obovate or obovate-oblong, 1.5–7.0 cm long, 0.5–1.5(2.0) cm wide, narrowed toward base, more or less densely arachnoid-hairy pubescent to subglabrous, more or less dense setaceous hairy beneath along midrib, spiny along margin; cauline laves with or without small undivided auricles
591 at the base; lower and middle leaves similar to basal; upper ones reduced, undivided, elliptical to lanceolate, arachnoid-hairy pubescent, with setaceous hairs beneath along midrib. Capitula 10–14 mm long at fruiting, terminal on tomentosely pubescent tips of densely setaceous hairy stems and its lateral branches; outer involucre bracts ovate or lanceolate, 3–4 mm long, acute, arachnoid-hairy pubescent on the outer side, inner bracts

9–13 mm long, densely arachnoid-hairy pubescent or sometimes tomentose on the outer side, with one or two rows of more or less dense setaceous hairs along midrib over entire length or only near the tip of bracts, less often absent. Peripheral achenes 5.0–5.5 mm long, densely papillose all over; achene body 2.5–3.0 mm long; beak (2)5–7 mm long; pappus 3.5–4.0 mm long. Flowering April to May (June).

Gravel-beds, rubbly and clayey slopes, alkali soils, saline marshes and sands in plains and foothills, often as weed.—*Soviet Central Asia*: Aralo-Caspian, KaraKum, Kyzhyl-Kum, Syr-Darya, Amu-Darya. *General distribution*: Iran. Described from Kara-Kum sands. Type in Paris; isotype in Leningrad.

GENUS 1671. *Heteracia* Fisch. and Mey.^{1,2}

Fisch. and Mey. Ind. Sem. Hort. Peteropol. I (1835) 29.

Capitula many-flowered, small, campanulate; fruits almost hemispherical; involucre two-rowed; outer involucre bracts few (two to five), small, inner 8–10, considerably longer than outer, lanceolate, herbaceous, connate at base. Receptacle glabrous. Florets yellow, outer slightly longer than involucre. Style with two linear stigmas. Achenes dimorphic: outer ones persistent, with very short beak, without pappus (or with reduced pappus), inner detaching, with long slender beak, with pappus of white toothed bristles at the apex, sometimes only with short beak and without pappus. Annual glabrous herbs with sessile cauline leaves sagittate.

A monotypic genus.

1. *H. szovitsii* Fisch. and Mey. in Ind. Sem. Hort. Petrop. I (1835) 29; DC. Prodr. VII, 178; Jaub. and Spach, Ill. pl. orient. III (1847–1850) 125; Ldb. Fl. Ross. II, 2, 830; Boiss. Fl. or III, 724; Grossh. Fl. Kavk. IV, 225; Nevski in Sorn. Rast. SSSR, IV (1935) 319; Kovalevskaya in Fl. Uzb. 6 (1962) 425.—*H. epapposa* (Rgl. and Schmalh.) M. Pop. in Tr. Uzb. Gos. Univ. Ser. Biol. 14 (1941) 88; Kovalevskaya, l.c.—*H. szovitsii* var. *epapposa* Rgl. and Schmalh. in Tr. Peterb. Bot. Sada, VI (1878) 329.—*lc.*: Jaub. and Spach, op. cit. t. 287; Nevski, op. cit. Fig. 485.

592 Annual. Plants glabrous, (5)8–25(30) cm high, with erect or often ascending, furcately branched stem. Basal leaves oblong or oblong-obovate, more or less sinuate-toothed to pinnatilobate and pinnatipartite

¹ Treatment by I.T. Vassilczenko.

² From the greek words *heteros*—different, and *achenia*—seed.

with deltoid lobes, petiolate; cauline leaves lanceolate or oblong-ovate, sessile, caudate-sagittate. Capitula planoconvex, 6–9(12) mm wide at fruiting, apical capitula sessile, lateral on clavate peduncles. Outer achenes wide, obpyramidal, grayish-reddish-brown, somewhat compressed dorsoventrally with two thickened spongy, ridge-like ribs, more or less transversely rugose (outer and inner) and laterally dilated above into wings, also spongy, suberous; achenes of next row obpyramidal with four or five thick ribs (of these two ridge-like, others narrow-winged); achenes of both outer rows with short conical beak, devoid of hairs or with small crown of short inconspicuous scales at the apex; inner achenes thin, cuneately cylindrical, about 3.0–3.5 mm long, light grayish-reddish-brown, with five furrows, upper part fine scaly-toothed and scabrous, apex truncate with filiform beak (two to two and one-half times as long as achenes), with very fine arc of erect bristles; beak terminating into pappus of white, radially divergent, about 3 mm long hairs. Flowering April to May.

Clayey, stony and sandy deserts (particularly foothills) and semideserts, gravel-beds of river valleys, often as weed in fields, also roadsides and near dwellings.—*European Part*: Crimea; *Caucasus*: Eastern and Southern Transcaucasia; *Soviet Central Asia*: All regions. *General distribution*: Asia Minor, Iran. Described from Transcaucasia. Type in Leningrad.

Note. M.G. Popov (op. cit.) considers var. *epapposa* Rgl. and Schmalh. as a separate species. According to Popov the following are the differences between the two species:

1. Beak of central achenes filiform, 8–10(12) mm long, with pappus at the apex. Plants more glaucous. Outer involucre bracts four or five, more conspicuous. Corolla pale yellow **H. szovitsii** Fisch. and Mey.
- + All achenes (including central) without pappus; beak of central achenes 3–5 mm long. Plants green. Outer involucre bracts two or three, less conspicuous. Corolla dark yellow **H. epapposa** (Rgl. and Schmalh.) M. Pop.

It must, however, be noted, firstly, that *H. epapposa* is found scattered throughout the distribution area of *H. szovitsii*; moreover, there are plants in which some capitula have central achenes of the usual type, i.e., with a long beak; but in others, the central achenes have a short beak (*H. epapposa* type). There are collections of both species from the same place. Given all this, in my opinion there is not yet a basis for recognizing *H. epapposa*. The latter, with greater justifications, can be considered as a variety of *H. szovitsii*, more xerophytic and typical of impoverished, less developed “soils” (for example, stony slopes, gravel-beds, and so on).

Kar. and Kir. in Bull. Soc. Nat. Mosc. XV (1842) 127.

Capitula small, with fruits globose-pyriform. Outer involucre bracts herbaceous, lanceolately linear, inner firmly connate into hard (with fruits) convex shell, open at the top, covered with short, light colored or long acicular spine (spines sometimes absent); apices of inner involucre bracts free, herbaceous, linearly lanceolate, covered with occasional small spines or smooth. Florets yellow, exerted from open top of connate involucre bracts of capitulum. Achenes laterally compressed, more or less curved, with short beak at the apex carrying inconspicuous pappus in form of five-toothed crown or small expansion.

Type of genus: *A. amplexifolius* Kar. and Kir.

1. Capitula covered with short scaly spines on outer side 1. *A. benthamianus* Rgl.
- + Capitula covered with long acicular spines on outer side 2. *A. amplexifolius* Kar. and Kir.

1. *A. benthamianus* Rgl. and O. Fedtsch. in Izv. Obshch. Lyubit. Estestv., Antrop. i Etnogr. III, 18 (1881) 47; O. and B. Fedtsch. Perech. Rast. Turk. 4 (1911) 222; Nevski in Sorn. Rast. SSSR, IV, 319; Kovalevskaya in Fl. Uzb. VI (1962) 422.—**Exs.:** GRF No. 3493.

Annual. Stem erect, 10 to 50(70) cm high, usually branched, with stiff, downward directed, setaceous bristle-like hairs in the lower part. Basal leaves petiolate, obovate or oblong-obovate, more or less sinuate-toothed; cauline leaves oblong-lanceolate, sessile, sinuate-toothed or subentire, sagittate. Capitula on coarse, clavate peduncles, 5–7 mm wide with fruits, covered with short downward directed, sometimes scaly and acute, spines. Achenes cuneate, weakly bent, about 5 mm long, 1.5–1.8 mm wide, laterally compressed, longitudinally sulcate, thickened, ribbed, more or less scaly-tuberculate along ribs, with very short beak at the apex, terminating into obtuse expansion, reddish-brown-grayish. Flowering April to May.

Clayey mountain slopes, often as weed in fields and roadsides.—*Soviet Central Asia:* Tien Shan, Syr-Darya, Pamiro-Alai, mountainous Turkmenia. *General distribution:* Indo-Himalayas, Iran. Described from area of Lake Iskander-Kul. Type in Leningrad.

Note. The involucre in *A. benthamianus* is sometimes smooth and

¹ Treatment by I.T. Vassilchenko.

² From the ancient Greek words *acanthos*—thorn, spine, and *cephalon*—head.

594 devoid of spines (var. *laevis* Vass). This variety is known from the area of Khovalinga (in Tadzhikistan). Most interesting also are the plants collected by a number of people in the upper parts of Zeravshan and in western Pamir, in irrigated valleys, which have oblong-obovate to sub-cylindrical, hardened involucre, only sparsely covered with spines and tubercles (var. *schugnanica* Vass.) It may be noted that in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR, there are also specimens of typical *A. benthamianus* in which, however, there are weakly spinose involucre, while some specimens bear capitula with smooth (or almost smooth) involucre on some branches, but on other branches have spinous involucre.

2. *A. amplexifolius* Kar. and Kir. in Bull. Soc. Nat. Mosc. XV (1842) 128; Ldb. Fl. Ross. II, 2, 651; O. and B. Fedtsch. Perech. Rast. Turk. 4 (1911) 229; Kovalevskaya in Fl. Uzb. VI (1962) 422.—*Harpachena amplexifolia* Bge. in Delect. Sem. Horti. Dorpat. (1845) 6; Jaub. and Sp. III. Pl. or. III (1847–1852) 129.—*Id.*: Jaub. and Sp. *ibid.* t. 288.

Annual. Plants entirely glabrous, with erect, weakly branched stem. Basal and lower cauline leaves oblongly obovate or obovate, glaucescent, with teeth on margin, usually petiolate; cauline leaves glaucescent, oblongly lanceolate, sagittate, sessile, more or less sinuate-toothed or subentire, few. Capitula terminal and axillary; outer involucre bracts herbaceous, lanceolate; inner bracts connate in lower part into nutlike hard cover in fruit, outer ones covered with long stramineous spine—bristles; in upper part of involucre inner bracts herbaceous, green, with fine teeth at apex. Outer achenes cuneate, more or less convex and transversely scaly-rugose, one of them dorsally firmly fused with involucre, others more slender, easily detached; inner achenes long and narrow, cylindrical, linear-lanceolate, with long beak bent sideward and downward, almost smooth (with indistinct longitudinal ribs). Flowering April to May.

Mountain slopes, river valleys, sometimes as weed in fields.—*Soviet Central Asia*: Dzhungaria-Tarbagatai, Aralo-Caspian, Balkhash Region, Tien Shan, Syr-Darya, Pamiro-Alai, Amu-Darya. Endemic. Described from Afghanistan. Type in Leningrad.

GENUS 1673. *Crepis* L.^{1, 2}

L. Sp. pl. (1753) 805 and Gen. pl. ed. 5 (1754) 350; DC. Prodr. VII,

¹ Treatment by S.K. Czerepanov.

² From the Greek word *crepis*—shoe, possibly from the resemblance of the shape of leaves of some species with the sole.

- 1 (1838) 160, p. p.; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 513, p. p.; Boiss. Fl. or. III (1875) 831, p. p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 373, p.p.; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 207, p.p. (The Genus *Crepis*, 2).—*Atracium* Neck. Elem. Bot. I (1790) 49.—*Barkhausia* Moench, Meth. (1794) 537.—*Catonia* Moench, ibid. (1794) 535, nec P. Br. (1756).—*Wibelia* Gaertn. Mey. and Scherb. Fl. Wett. III, 1 (1801) 97, 144.—*Hostia* Moench, Meth. Suppl. (1802) 221.—*Berinia* 595 Brignol. Fasc. rar. pl. Forojal. (1810) 50.—*Lepicaune* Lapeyr. Hist. Abr. Pl. Pyr. (1813) 478.—*Nemauchenes* Cass. in Bull. Soc. Philom. Paris (1818) 77.—*Gatylona* Cass. in Dict. Sc. nat. XVIII (1820) 184.—*Lagoseris* Hoffm. and Link, Fl. Port. II (1820) 149, non M.B. (1810).—*Rodigia* Spreng. Neu. Entd. I (1820) 275.—*Paleya* Cass. in Dict. Sc. nat. XXXIX (1826) 393.—*Phaeacasium* Cass. ibid. (1826) 387.—*Anisoderis* Cass. ibid. XLVIII (1827) 429.—*Brachyderea* Cass. ibid. (1827) 429.—*Omalocline* Cass. ibid. (1827) 431.—*Idianthes* Desc. Fl. Anj. (1827) 199.—*Crepidium* Tausch in Flora, XI, 1 (1828) 80, non Blume (1825).—*Intybus* Fries, Nov. pl. Suec. ed. 2 (1828) 244.—*Barkhausenia* Hoppe in Flora, XII (1829) 512.—*Calliopea* D. Don in Edinb. new phil. journ. (1829) 309.—*Geracium* Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1345, 1367, and Fl. germ. excurs. I (1830) 259.—*Hapalostephium* D. Don, op. cit. (1829) 307.—*Intybellia* Monn. Ess. monogr. Hierac. (1829) 78, non Cass. (1821).—*Sclerophyllum* Gaudin, Fl. Helv. V (1829) 47.—*Soyeria* Monn. op. cit. (1829) 75.—*Pachylepis* Less. Synops. Comp. (1832) 139. — *Anisoramphus* DC. Prodr. VII. 1 (1838) 251.—*Endoptera* DC. ibid. (1838) 178.—*Limnoseris* Peterm. Fl. Lips. excurs. (1838) 589.—*Phalacroderis* DC. op. cit. (1838) 97.—*Aegoseris* (Rchb.) Steud. Nomencl. bot. ed. 2, 1 (1840) 30.—*Billotia* Sch. Bip. in Herb. and Winck. Jahrb. Pharmac. IV (1841) 155, in nota, non G. Don (1832).—*Psilochaenia* Nutt. in Trans. Am. Phil. Soc. new ser. 7 (1841) 437.—*Youngia* auct. p. min. p. non Cass.: Ldb. Fl. Ross. II, 2 (1846) 836.—*Cymboseris* Boiss. Diagn. pl. or. ser. I, 11 (1849) 50.—*Psammosaris* Boiss. ibid. (1849) 52.—*Anthochytrum* Rchb. f. Ic. Fl. Germ. XIX (1859) 39, t. 1432.—*Hieracioides* Rupr. Fl. Ingr. (1860) 624; O. Ktze. Rev. gen. I (1891) 345, p. p. "*Hierciodes*".—*Ceramioccephalum* Sch. Bip. in Bull. Soc. Bot. France, IX (1862) 284.—*Rhynchopappus* Dulac, Fl. Hautes-Pyr. (1867) 493.—*Lepidoseris* (Rchb.) Fourr. in Ann. Soc. Linn. Lyon, nouv. ser. XVII (1869) 103.—*Limnocrepis* Fourr. ibid. (1869) 104.—*Succisocrepis* Fourr. ibid. (1869) 104.

Capitula homogamous, large, medium or small, with many florets (in many species of section *Ixeridopsis* 9–13 florets), clustered in corymbose, paniculate, less often racemose inflorescence, one to five on stem. Involucre campanulate or cylindrical, (1.5)2–15(18) mm wide; involucre bracts variously pubescent on outer side, sometimes glabrous, without subterminal coriaceous (in some species of section *Ixeridopsis*, inner

bracts with cornicle or tuberculate thickening), glabrous or appressed hairy (inner) on inner side; outer bracts (4)5–18(20), one- or many-rowed, ovate to linear, acuminate, acute, less often obtuse, of unequal length, one-fourth to two-thirds as long as inner or very small (in species of section *Ixeridopsis* and *Phaecasium*); inner bracts 8–18, two-rowed, oblong or linear-lanceolate, acuminate to obtuse, of equal length, with scarious border (mostly innermost), changing little at fruiting or carinate on the outer side, sometimes covering peripheral achenes, with spongy thickening below, often deflected. Receptacle pitted or faveolate, ciliolate, ciliate-fimbriate or glabrous. All florets ligulate, mostly yellow, one and one-half to two times as long as involucre, of same kind, bisexual. Corolla 6–26(28) mm long; ligule with five teeth; corolla tube 2–8 mm long, pubescent with long or very short hairs, or glabrous. Anthers with small basal appendage; stamen filaments flattened, glabrous. Style bipartite; style
 596 branches dark green, green or yellow, divergent. Achenes all alike, 1.5–18.0 mm long, fusiform or columelliform, terete, very slightly narrowed at both ends, without beak or attenuate above into short beak-like narrowing or long slender beak; less often achenes of different kinds; peripheral achenes laterally compressed, without beak; inner achenes terete with long slender beak, longer; all with 10–20(22) prominent thin ribs of equal thickness, spinose, short hairy or smooth and glabrous, sometimes with longitudinal stripes, areola of achenes straight; pappus (in *C. pulchra* peripheral achenes without pappus), as long as, slightly longer or shorter than achenes, usually white, of numerous, persistent or readily shedding, scabrous-serrate, soft or stiff, nonfragile hairs of equal length, connate at the base into ring or free. Perennials, biennials or annuals, pubescent, less often glabrous herbs with virgate root or rhizome, mostly with erect, leafy or leafless stems, small-toothed, sinuate-toothed, pinnatipartite, less often pinnatisect or entire, basal and lower cauline leaves.

Type (lectotype) of genus: *C. biennis* L.

Species of the genus *Crepis* L. are found in Europe, Asia, Africa, and North America. According to Babcock (in *Univ. Calif. Publ. Bot.*, 23 (1951) 397), this genus includes 204 species (of these, we have 52). However, their actual number is undoubtedly higher because, in recent years, many new species have been described. Moreover, Babcock interpreted some species in a very broad sense, separating subspecies within them, which, in most cases, in my opinion, ought to be considered as separate species.

The availability of the excellent monograph of the genus *Crepis* L. by Babcock, published in 1947, helped me, without special difficulties, to treat indigenous species.

In my treatment, I have accepted Babcock's system with small changes. I am retaining the independence of the genus *Lagoseris* M.B., restoring the priority names of the sections and, in some cases, adopting a narrower interpretation of the circumscription of the species.

According to the published information, most species of the genus *Crepis* L. are eaten and even relished by domestic animals.

1. Plants rhizomatous; rhizome short, vertical or oblique, with numerous thin roots 2.
- + Plants with long string-like root, modified above into short, simple or sparsely branched caudex or rhizome 18.
2. Inner involucre bracts glabrous on the inner side 3.
- + Inner involucre bracts appressed hairy on the inner side 13.
3. Involucre campanulate, 10–16 mm long and (4)6–10(12) mm wide. Achenes 4–10 mm long, 0.75–1.3 mm wide, pappus yellowish or whitish, 6–10 mm long 4.
- 597 + Involucre narrowly campanulate or cylindrical, 7–12 mm long and 2.5–5.0 (6.0) mm wide. Achenes 3–5(6) mm long and 0.4–0.7 mm wide; pappus white, 4–6(7) mm long 7.
4. Stem and leaves pubescent beneath. Corolla 20–26(28) mm long; corolla tube pubescent with long and thin hairs. Achenes 7.5–10.0 mm long, 1.1–1.3 mm wide, with 20 and more spiny, short-hairy ribs; pappus 8–10 mm long 1. ***C. sibirica*** L.
- + Stems and leaves glabrous. Corolla 12–20 mm long; corolla tube pubescent with sparse, very short coarse hairs, or glabrous. Achenes 4.0–5.5 mm long, 0.75 mm wide, with 10 smooth, glabrous ribs; pappus 6–7 mm long 5.
5. Involucre bracts glabrous on the outer side 3. ***C. caucasica*** C.A.M
- + Involucre bracts glandular-hairy on the outer side 6.
6. Basal and lower cauline leaves sinuate-coarse toothed, often almost pinnatifid in the lower half, gradually narrowed into petiole, petiole as long or half as long as lamina; middle cauline leaves mostly lanceolate or oblong-lanceolate, sessile, amplexicaul, usually sagittate. Peduncles slender. Plants of the European part of the USSR and Europe 2. ***C. paludosa*** (L.) Moench
- + All (except uppermost cauline) leaves remotely toothed or sinuate-toothed; basal and lowermost cauline leaves rather abruptly narrowed into petiole, petiole less than half as long as lamina; middle cauline leaves mostly oblong-ovate, ovate-lanceolate or oblong-lanceolate, together with some cauline leaves sessile, amplexicaul, broadly cordate or sagittate. Peduncles thicker. Plants of the Caucasus 4. ***C. glabra*** Boiss.

- 7(3). Stems leafless, less often with one or two(three) small, linear cauline leaves 8.
- + Stems leafy; cauline leaves more or less large 11.
8. Outer involucre bracts 8–12. Receptacle punctate, glabrous. Ligules 1.5–2.5 mm wide. Achenes with 20 ribs; pappus two- or four-rowed 9.
- + Outer involucre bracts four to eight. Receptacle foveate, glabrous. Ligules 0.6–1.2 mm long. Achenes with 10–12 ribs; pappus one-rowed 10.
9. Involucre bracts on the outer side and peduncles pubescent with eglandular hairs, or glabrous. Achenes 3.5–4.0 mm long and 0.5 mm wide with spiny-short hairy ribs; pappus 4.5–5.0 (5.5) mm long 34. **C. praemorsa** (L.) Tausch
- + Involucre bracts on the outer side and peduncles pubescent with short glandular hairs. Achenes 5–6 mm long and 0.5–0.7 mm wide, with almost smooth and glabrous ribs; pappus 5.5–6.0 mm long 35. **C. caucasigena** Czer.
- 598 10. Involucre 9–11 mm long and 4–5 mm wide; outer involucre bracts one-third to half as long as inner; inner involucre bracts 12–13. Corolla 13–15 mm long; corolla tube 5.0–5.5 mm long, pubescent in the upper part with short coarse hairs. Achenes about 5 mm long; pappus 5–6 mm long. Stems one or two (three) 42. **C. gmelinii** (L.) Tausch
- + Involucre 7–9(10) mm long and 2.5–3.0(4.0) mm wide; outer involucre bracts one-sixth to one-fourth as long as inner, inner involucre bracts 8–10. Corolla 6–7 mm long; corolla tube 2.5–3.0 mm long, pilose in the upper part with rather long, thin hairs. Achenes 3.5–4.0 mm long; pappus 4.0–4.5 mm long. Stems few or relatively numerous, less often single 43. **C. multicaulis** Ldb.
- 11(7) Corolla 14–18 mm long, corolla tube weakly pubescent with short coarse hairs. Basal and lower cauline leaves lyrate, sinuate-toothed, less often with small teeth 11. **C. lyrata** (L.) Froel
- + Corolla 11–13 mm long, corolla tube more or less densely pilose with fairly long and thin hairs 12.
12. Basal and lower cauline leaves entire or with remote small teeth. Receptacle glabrous. Achenes with 20 ribs 12. **C. mollis** (Jacq.) Aschers.
- + Basal and lower cauline leaves lyrate-pinnatisect. Receptacle with ciliate fimbria. Achenes with 15 ribs 13. **C. willemetioides** Boiss.
- 13(2) Involucre 9–10 mm long and about 6 mm wide. Corolla 12–13 mm long. Style branches dark green. Stems (one or two), thin,

well proportioned, weakly thickened below capitula, 6–18 cm high. Plants of northern Amur (Dusse-Alin and Gorin-Amgun ranges)

..... 7. **C. burejensis** Fr. Schmidt

- + Involucre 12–16 mm long and (7) 8–12 mm wide. Corolla 13–20 mm long. Stems (one to three), thicker, more or less distinctly thickened below capitula 14.

14. Achenes 4.0–4.5 mm long. Plants small, with simple stem, 3–7 cm high. Basal leaves pinnatisect, less often pinnatipartite

..... 9. **C. czuensis** Serg.

- + Achenes 6–10 mm long. Stem (5)6–28 cm high..... 19.

15. Corolla tube 3–4 mm long, scatteredly pubescent with very short coarse hairs. Style branches dark green. Achenes with 20 ribs. Stems more or less thick, weakly thickened below capitula, with one or two (three) branches, less often simple. Basal leaves irregularly toothed or shallow pinnatilobate

..... 5. **C. hokkaidoensis** Babc.

- + Corolla tube 4–9 mm long. Style branches yellow. Achenes with (10)12–15 (in *C. karakuschensis* probably 20) ribs. Stem mostly distinctly thickened below capitula 16.

- 599 16. Involucral bracts ovate or oblong-lanceolate, outer densely covered with mixture of short, glandular, slightly reddish-brown hairs and somewhat long eglandular, whitish-yellowish bristles. Receptacle tuberculate, glabrous. Corolla tube pilose with more or less long and thin hairs. Achenes 0.5–0.7 mm wide, with smooth, glabrous ribs. Stems and leaves covered with rather dense, very short glandular hairs 10. **C. karakuschensis** Czer.

- + Involucral bracts linear-lanceolate, like stem near capitula densely covered on the outer side with long eglandular hairs, dark green, blackish-green or greenish-yellow, somewhat stiff, mixed with few short glandular hairs. Receptacle faveolate, ciliolate-fimbriate. Corolla tube pubescent with scattered and coarse hairs or glabrous. Achenes 0.7–1.0 mm long, with spiny, short hairy ribs. Stem and leaves differently pubescent 17.

17. Rhizome short, with numerous slender roots. Stems more or less simple, glabrous in the lower half, less often entirely scatteredly woolly arachnoid-hairy. Basal leaves sinuate-toothed to entire, glabrous or weakly arachnoid-hairy above; hairs dark- or blackish-green on involucral bracts on the outer side and on stem in the upper part 6. **C. chrysantha** (Ldb.) Turcz.

- + Rhizome more or less long, simple or sparsely branched. Stem branched from middle or simple, arachnoid-hairy, finely tomentose throughout. Basal leaves runcinate or pinnatilobate, sometimes sinuate-toothed, arachnoid-hairy on both surfaces. Hairs greenish-

- yellow on involucre bracts on the outer side and on stem in the upper part 8. **C. polytricha** (Ldb.) Turcz.
- 18(1) All or only inner achenes with long and slender, 1.5–10.0 mm long beak. Annuals or biennials 19.
- + All achenes without beak, slightly narrowed at both ends or narrowed above into short, more or less thick, up to 0.7(1.0) mm long, beak-like, narrowing 25.
19. Achenes of two types, peripheral 5–16 mm long and 0.6–1.5 mm wide, laterally compressed, without beak or without beak or with short thick beak, densely pubescent with short, white thin hairs on the inner side, subglabrous on the outer side; inner achenes 9–18 mm long (with beak) and 0.4–0.6 mm wide (body), cylindrical, narrowed into 4.10 mm long beak, with 15–18 spiny, short hairy ribs, less often flat; pappus considerably longer than involucre ..
..... 20.
- + All achenes alike, 3.7–8.0 mm long (with beak) and 0.4–0.5 mm wide (body), cylindrical, narrowed into 1.5–4.5 mm long beak, with 10 spiny, short-hairy ribs, pappus slightly longer than involucre 24.
- 600 20. Involucre cylindrical to top-shaped at fruiting, enlarged below, 16–22(25) mm long; outer involucre bracts broadly ovate or ovate-lanceolate, entirely membranous, more or less of equal length. Peripheral achenes (12)14–16 mm long and 1.0–1.2 mm wide. Stem weakly short-arachnoid-hairy, sometimes finely tomentose, scabrous in the upper part from short thin spines
..... 46. **C. alpina** L.
- + Involucre broadly campanulate at fruiting, not enlarged below, (9)10–13 mm long; outer involucre bracts linear-lanceolate or linear, not membranous, of unequal length. Peripheral achenes 5.0–8.5 mm long and 0.6–1.5 mm wide. Stem with different kind of pubescence 21.
21. Basal, lower and middle cauline leaves pinnatilobate; runcinately pinnatifid or almost pinnatisect, less often sinuate-toothed. Capitula drooping before anthesis; inner involucre bracts densely hairy on the inner side, not keeled on the outer side, thickened in the lower part. Style branches dark green, greenish, sometimes yellow 22.
- + Basal, lower and middle cauline leaves mostly with small-teeth or sinuate-toothed. Capitula erect; inner involucre bracts scatteredly hairy on the inner side in the upper part or glabrous, keeled on the outer side, thickened. Style branches yellow 23.
22. Involucre (6)8–12 mm long; involucre bracts on the outer side and peduncles in the upper part with dense, more or less long,

- eglandular, yellowish, basally thickened bristles, sometimes mixed with few glandular hairs; outer bracts one-third to half as long as, less often scarcely shorter than inner bracts 48. **C. rheadifolia** M.B.
- + Involucre narrower, narrow-campanulate; involucre bracts on the outer side and peduncles in the upper part with dense glandular hairs, yellowish or reddish-brown, somewhat thin, outer bracts half as long as inner 47. **C. foetida** L.
23. Stem 15–40(60) cm high, with obliquely erect branches, as also involucre bracts, covered with long eglandular hairs on the outer side in the upper part, mixed with few short glandular hairs. Basal and lower cauline leaves 5–16(22) mm long and 0.8–3.0(3.5) mm wide. Inner involucre bracts not deflexed at fruiting. Receptacle ciliolate-fimbriate. Corolla 12–14 mm long, Peripheral achenes 6.5–8.5 mm long and 0.6–0.7 mm wide, attenuated into short and thick beak, inner achenes striped 49. **C. trichocephala** (Krasch) V.V. Nikit.
- + Stem 5–20 cm high, divaricately branched, tomentose, as also involucre bracts glandular and short-hairy, mixed with long eglandular hairs. Basal and lower cauline leaves 1.5–3.5 cm long and 0.5–0.8 cm wide. Inner involucre bracts keeled at fruiting. Receptacle glabrous. Corolla 8.0–8.5 mm long. Peripheral achenes 5–6 mm long and 1.0–1.5 mm wide, without beak; inner ribbed 50. **C. kotschyana** Boiss.
- 24(19) Involucre bracts covered with rather dense short glandular hairs on the outside; outer bracts five to seven; ovate-lanceolate or ovate, with wide scarious border. Achenes 6.5–8.0 mm long (including beak) 51. **C. marschallii** (C.A.M) F. Schultz
- + Involucre bracts covered with long, eglandular, basally distinctly broadened, stiff hairs on the outside; outer bracts 10–14, linearly lanceolate, without scarious border, Achenes 3.7–5.0(5.5) mm long 52. **C. setosa** Haller f.
- 25(18) Plants entirely glabrous (only in *C. corniculata* involucre bracts pubescent on the outside), glaucescent, perennial. Stems mostly strongly branched from the base or middle, not hollow. Capitula with 9–13 florets 26.
- + Plants more or less pubescent. Stems less strongly branched, sometimes simple, usually hollow. Capitula with many florets 32.
26. Involucre bracts finely tomentose or arachnoid-hairy on the outside; inner bracts with distinct preterminal cornicle 27. **C. corniculata** Rgl. and Schmalh.
- + Involucre bracts glabrous on the outside, inner bracts without

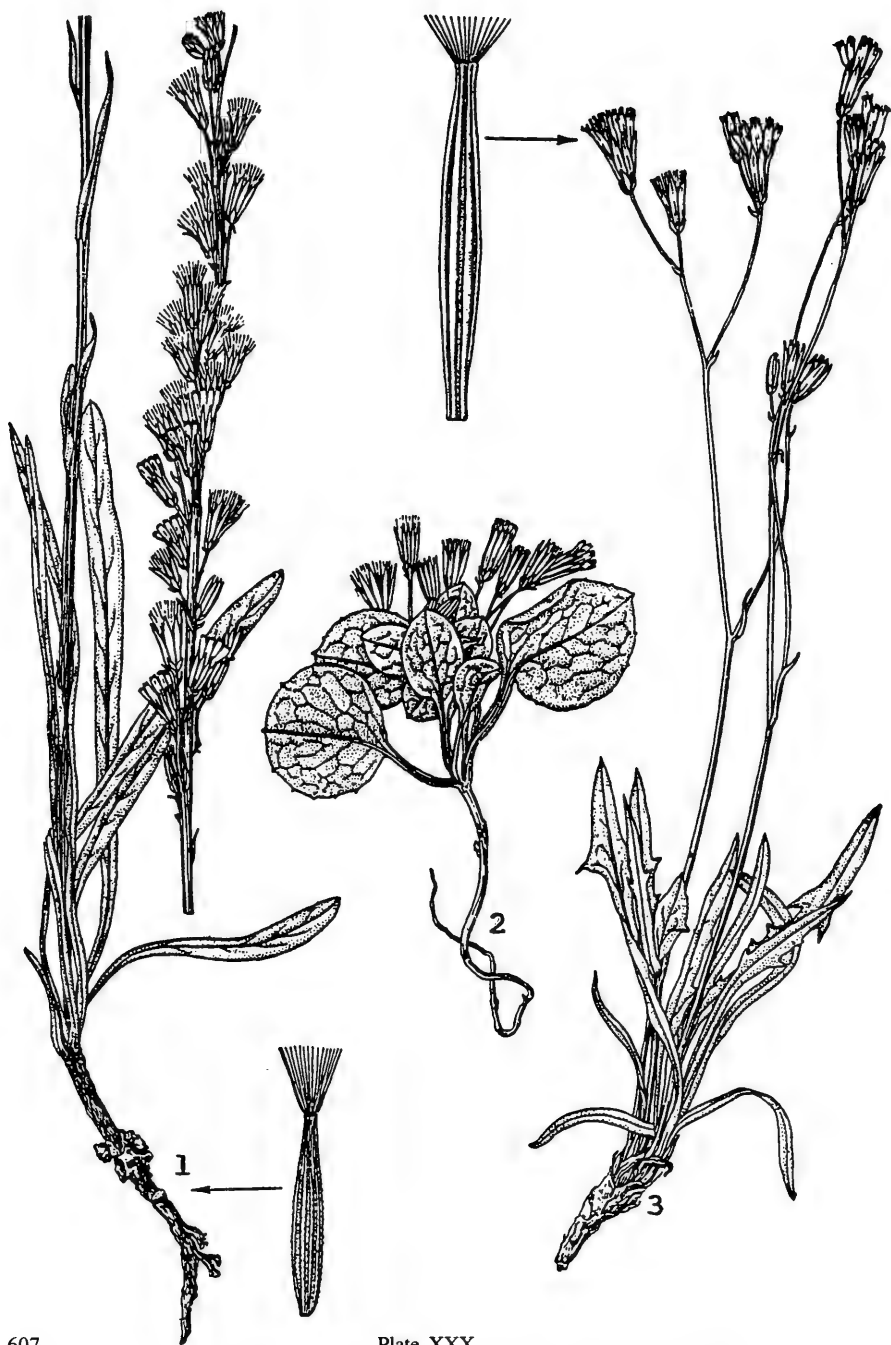
- subterminal cornicle, less often with indistinct tubercular thickening 27.
27. Stems few or many, 5–30 cm high, strongly branched from the base. Basal and lower cauline leaves irregularly sinuate-toothed, pinnatipartite, sometimes pinnatisect, early-withering, middle cauline leaves narrow, linear-lanceolate or narrowly lanceolate, entire or similar to basal and lower cauline leaves. Capitula numerous, involucre 6–9(10) mm long and 1.5–3.0 mm wide 28. *C. flexuosa* (Ldb.) Clarke
- + Stems few or solitary, 3–10(15) cm high, sometimes plant pulvinate, less strongly branched from the middle or base. Basal and lower cauline leaves entire with small teeth, pinnatilobate, less often almost pinnatipartite, not withering; middle cauline leaves similar to basal and lower cauline leaves. Capitula fewer; involucre 8–14 mm long and (1.5)2.0–5.0 mm wide 28.
28. Leaves abruptly narrowed into petiole. Corolla tube glabrous 29.
- + Leaves gradually narrowed into petiole. Corolla tube mostly sparsely covered with very small coarse hairs 31.
29. Florets pink-purple; corolla 11–14 mm long. Stems slender, sometimes lodged, terete, 5–10 cm high; leaves elliptical, ovate or oblong-obovate, with remote small teeth or entire, 0.5–1.3 mm wide 32. *C. lactea* Lipsch.
- 602 + Florets yellow. Stems rather thick, erect, slightly flattened 30.
30. Stems 7–10 cm high; leaves with reticulate venation beneath; basal and lower cauline leaves round or round-ovate, with remote small teeth, 1.5–3.5 cm long and 1.0–3.5 cm wide. Involucre 12–14 mm long and 4–5 cm wide; corolla 13–15 mm long. Achenes 7–8 mm long and about 1 mm wide 31. *C. sogdiana* (Krasch.) Czer.
- + Stems 3–7(10) cm high, sometimes so strongly reduced that plant appears pulvinate. Leaves indistinctly reticulate. Basal and lower cauline leaves ovate-round to almost oblong, entire or with few teeth, less often lyrate-lobed or lyrate-lyrate pinnatipartite, 0.6–2.0 (very rarely to 3.3) cm long and 0.4–1.3(1.7) cm wide. Involucre 9–10(11) mm long and (1.5)2.0–3.0 mm wide. Corolla 7.0–8.5 (10.0) mm long. Achenes 4.5–6.5 mm long and 0.5–0.6 mm wide 33. *C. nana* Richardson
31. Stems with more or less thickish branches. Leaves pubescent in axils; basal and lower cauline leaves 10.5–35 cm long, obovate or oblong-obovate, with irregular large teeth or pinnatilobate with rather approximate teeth or with large-toothed wide lobes, on wide petioles, much shorter than lamina. Pappus 5.5–6.5 mm long ... 29. *C. alaica* Krasch.

- + Stems with slender branches. Leaves glabrous in axils, basal and lower cauline leaves 2.7 cm long, oblanceolate, elliptical or oblong-oblanceolate (less often obovate), with remote small teeth, irregularly sinuate-toothed, lyrate or pinnatilobate, sometimes almost pinnatifid or entire, with slender petiole as long as lamina, slightly shorter, less often longer. Pappus (6)7–9 mm long 30. **C. karelinii** M. Pop. and Schischk. ex Czer.
- 32(25) Involucre 5–7 mm long. Receptacle glabrous. Achenes 1.5–2.5 mm long, with 10 smooth glabrous ribs; pappus 3–4 mm long. Annuals 33.
- + Involucre (6)7–17 mm long. Receptacle ciliolate or ciliate-fimbriate, less often glabrous, but then involucre and achenes more of less large. Achenes 3–10 mm long, with 10–20(22) spiny short hairy, less often smooth and glabrous, ribs or stripes; pappus (3.5)4.0–10.0 mm long 34.
- 33. Involucre 3.5–5.0 mm wide, involucre bracts weakly arachnoid-hairy on the outside, with one row of glandular blackish stiff hairs along midrib; inner involucre bracts 12–13, oblong-lanceolate. Style branches greenish or yellowish-greenish 44. **C. capillaris** (L.) Wallr.
- 603 + Involucre 2.5–3.0(4.0) mm wide; involucre bracts weakly arachnoid-hairy on the outside with or without one row of rather long eglandular yellowish bristles along midrib; inner involucre bracts 8–10, linear-oblong. Style branches dark green 45. **C. micrantha** Czer.
- 34. Involucre bracts glabrous on both surfaces, outer bracts one-fifth to one-sixth as long as inner. Corolla tube with dense, long, thin hairs. Achenes with longitudinal stripes, mostly without pappus. Plants annuals 41. **C. pulchra** L.
- + Involucre bracts pubescent on both surfaces or glabrous on the inside, but then plants perennials; outer bracts one-third (one-fourth) to two-thirds as long as inner. Corolla tube with scattered, short, more or less coarse hairs, less often glabrous. Achenes longitudinally ribbed, all with pappus 35.
- 35. Stems 5–20(30) cm high, leafless or with one or two (three) very small, usually bracteal leaves. 36.
- + Stems (5)12–120 cm high, leafy with more or less large (lower and middle cauline) gradually reducing leaves 39.
- 36. Leaves pinnatisect; leaf segments and teeth on segments with more or less dense sharp spinules along margin or with setaceous hairs. Achenes with 20 ribs; pappus 8–10 mm long. Plants of Caucasus 37.
- + Leaves sinuate-small toothed, runcinately pinnatilobate or deeply

- pinnatipartite; lobes or leaf segments without spinules along margin, smooth or with remote large tubercles or sharp spinules. Achenes with 10–13 ribs; pappus 8–10 mm long. Plants of Caucasus . 37.
- + Leaves sinuate-small toothed, runcinately pinnatilobate or deeply pinnatipartite; lobes or leaf segments without spinules along margin, smooth or with remote large tubercles or sharp spinules. Achenes with 10–13 ribs; pappus 4–7(8) mm long. Plants of Soviet Central Asia-Siberia 38.
37. Corolla pale pink, 20–22 mm long. Leaves grayish-green above, finely tomentose, grayish-tomentose beneath; leaf segments and teeth of segments with sparse and short setaceous hairs on margin 24. **C. alikeri** Tamamsch.
- + Corolla yellow, 16–18 mm long. Leaves densely grayish tomentose on both surfaces, leaf segments and teeth of segments with more or less dense spinules on margin 23. **C. willdenowii** Czer.
38. Caudex 0.5–1.5 cm long. Involucre 10–15 mm long and 7–10 mm wide; involucre bracts mostly with dense and long, yellowish or greenish eglandular setaceous hairs mixed with mostly numerous shorter glandular ribs, less often without stem. Receptacle ciliate-fimbriate 26 **C. crocea** (Lam.) Bab.
- + Caudex 1–3 cm long, Involucre 9–12 mm long and (6)7–9 mm wide; involucre bracts with mostly a few long hairs, dark green or blackish, glandular bristles and less often with spinules on the outside along midrib. Receptacle glabrous 25. **C. oreades** Schrenk.
- 604 39(5) Perennial. Inner involucre bracts glabrous on the inside, less often pubescent 40
- + Annuals or biennial. Inner involucre bracts pubescent on the inside 47.
40. Achenes 4–5 mm long and 0.5–0.6 mm wide, with 10–12 ribs. Root slender. Basal and lower cauline leaves with remote small teeth, irregularly sinuate-toothed, very rarely pinnatilobate 36. **C. bungei** Ldb.
- + Achenes (4.5)5.0–10.0 mm long and 0.8–1.0 mm wide, with 15–20(22) ribs. Root thicker, woody, terminating above into short, simple or sparsely branched caudex covered with remnants of petioles of dead leaves 41.
41. Ribs of achenes smooth, glabrous. Inner involucre bracts weakly pubescent on the inside, less often glabrous. Stem hollow 42.
- + Ribs of achenes spiny short-hairy. Inner involucre bracts glabrous on the inside. Stem not hollow 43.
42. Petioles of basal and lower cauline leaves narrow-winged, (half) one-third as long as lamina; middle and upper cauline leaves more

- or less rounded at base, indistinctly amplexicaul. Peduncles thick, scarcely thickened below capitula (Caucasus) 14 **C. pontica** C.A.M
- + Petioles of basal and lower cauline leaves usually broad-winged, very short, middle and upper cauline leaves sagittately auriculate at the base, distinctly amplexicaul. Peduncles thicker, distinctly thickened below capitula (Carpathians) 15. **C. conyzifolia** (Gouan) Dalla Torre
43. Stems (15)20–100(120) cm high, with rather large, mostly numerous cauline leaves, more or less strongly branched 44.
- + Stems 7–11 cm high, with fewer linear or bract-like cauline leaves, simple or with one branch 21. **C. khorassanica** Boiss.
44. Involucral bracts grayish- and fine-tomentose, on the outside, densely glandular short-hairy. Basal and lower cauline leaves to 5 cm wide, oblong-ob lanceolate or oblanceolate, with small teeth or sinuate-toothed; middle and upper cauline leaves ovate to oblong-lanceolate, mostly with small teeth 16. **C. darvazica** Krasch.
- + Involucral bracts grayish-tomentose of grayish-arachnoid hairy on outside, usually with rather numerous or sparse, thick spinules or tubercles along midrib 45.
45. Capitula racemose, paniculate or less often corymbose-paniculate. Stems hard, branched mostly apically or in the upper third with short, rather thick branches. Basal and lower cauline leaves to 7(10) cm wide, oblong-obovate to oblanceolate, sinuate-toothed, sometimes lobed in the lower part, middle cauline ovate to lanceolate, sinuate-toothed or with small teeth, sagittately amplexicaul 20. **C. pannonica** (Jacq.) C. Koch
- + Capitula lax corymbose or racemose-corymbose. Stem much slender, branched from the middle or almost from the base, with long slender branches 46.
46. Branches mostly simple. Basal and lower cauline leaves 0.7–1.5(2.0) cm wide, oblanceolate, with small teeth to pinnatilobate; middle cauline leaves lanceolate or linear, often entire, usually semiamplexicaul. Involucral bracts grayish-tomentose, on the outside, sometimes with few short and thick bristles along midrib. Receptacle long ciliate. Achenes with 15–17 ribs 22. **C. turcomanica** Krasch.
- + Branches of stem branched. Basal and lower cauline leaves to 5 cm wide, oblong-ob lanceolate, or oblanceolate, mostly lyrate or lyrate pinnatifid, middle cauline leaves oblong-lanceolate, sinuate-toothed or deeply pinnatifid, usually semiamplexicaul. Involucral bracts more or less densely grayish tomentose on the outside, with rather numerous or sparse, thin, angular spines or

- tubercles along midrib. Receptacle ciliolate. Achenes with 18–20 ribs 17. **C. sonchifolia** (M.B) C.A.M.
- 47(39) Style branches yellow, Achenes pale reddish-brown or straw-colored, (0.6)0.8–1.0 mm wide, somewhat strongly narrowed above, with (11)13–20 ribs 48
- + Style branches dark green or green, less often yellowish. Achenes dark- or blackish-reddish-reddish-brown 0.4–0.5 mm wide, strongly narrowed above or attenuated into very short (0.5–0.7 mm long) beak-like narrowing, with 10 ribs 49.
48. Stem, leaves mostly along margin and beneath along midrib, and involucre bracts on the outside covered with somewhat long eglandular bristles. Middle and upper cauline leaves sagittately amplexicaul. Involucre (10)12–13 mm long and 8–10 mm wide. Achenes with 18–20 ribs 18. **C. ciliata** C. Koch
- + Stem, like leaves, covered in the lower half with erect short glandular, somewhat stiff hairs, above slightly woolly-arachnoid-hairy or subglabrous, sometimes subglabrous over entire length. Middle and upper cauline leaves not amplexicaul, or scarcely amplexicaul, not sagittate. Involucre 8–13 mm long and 5–8 mm wide; inner involucre bracts with sparse, long, eglandular bristles or shorter glandular hairs on the outside, often mixture of both. Achenes with (11)13–18 ribs 19. **C. biennis** L.
- 606 49. Involucre 9–13 mm long and (4)5–7 mm wide, dark green; involucre bracts on the outside and stem mostly above with long hairs, eglandular, blackish, less often greenish bristles. Corolla (12)13–17 mm long 40. **C. nigrescens** Pohle
- + Involucre 6–9(10) mm long and 3–5(6) mm wide, pale green or green; involucre bracts on the outside and stem pubescent otherwise. Corolla 7–13 mm long 50.
50. Stem strongly branched, including leaves sharply scabrous from short, eglandular, pale bristles or spines, and usually scatteredly arachnoid-hairy. Involucre bracts weakly greenish-arachnoid hairy and with eglandular, slightly yellowish, long bristles along midrib 38. **C. ramosissima** Urv.
- + Stem less strongly branched, weakly arachnoid-hairy, often slightly scabrous above, smooth below. Leaves glabrous or scatteredly arachnoid-hairy 51.
51. Involucre 7–9(10) mm long; involucre bracts grayish on the outside, finely arachnoid-hairy and with short glandular, mostly pale hairs, sometimes mixed with numerous long, also glandular bristles. Corolla 10–13 mm long. Style branches dark green. Stem mostly solitary, (7)12–90 cm high, erect, usually branched at the apex or from middle 37. **C. tectorum** L.



- + Involucre 6–7(8) mm long; involucre bracts weakly grayish arachnoid-hairy, sometimes with short hairs and eglandular white bristles along midrib. Corolla 7–10 mm long. Style branches greenish or yellowish. Stems more or less numerous, 5–15(25) cm high, ascending, less often partly procumbent, slender, branched from the base or middle 39. **C. astrachanica** Stev. and Czer.

Section 1. *Hapalostephium* (D. Don) Froel. in DC. Prodr. VII, 1 (1836) 165 p. p.—*Aracium* Neck. Elem. Bot. I (1790) 49; Monn. Ess. Monogr. Hierac. (1829) 73, p. p.—*Hapalostephium* D. Don in Edinb. New Phil. Journ. (1829) 307 p. p.—*Soyeria* Monn. op. cit. (1829) 75 p. min. p.—*Crepis* d. *Catonia* Rchb. Fl. germ. excurs. I (1830) 258, p. min. p. descr. and in Moessl. Handb. ed. 2, II, 2 (1829) 1402, p. min. p. nomen.—*Geracium* Rchb. op. cit. (1829) 1345, 1367, p. min. p. and (1830) 259, p. min. p.—*Crepis* sect. *Hieracioides* Froel. in DC. op. cit. (1838) 167, p. min. p.—*Crepis* sect. *Crepis* §2 Koch, Synops. ed. 2, 2 (1844) 506, p. p.—*Crepis* sect. *Crepis* §4 Koch, *ibid.* (1834) 508. *Crepis* sect. *Daucocrepis* Sch. Bip. ex Bisch. Beitr. Fl. Deutschl. Schweiz. (1851) 248, 294, p. min. p.—*Crepis* sect. *Succisocrepis* Sch. Bip. ex Bisch. *ibid.* (1851) 248, 308, p. min. p.—*Aracium* subgen. *Chrysoracium* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 319.—*Soyeria* A. *Trachelioracium* Sch. Bip. *ibid.* (1866) 321, p. min. p.—*Limnocrepis* Fourr. in Ann. Soc. Linn. Lyon. nouv. sér. XVII (1869) 104.—*Crepis* sect. *Soyeria* (Monn.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515, p. min. p.—*Crepis* sect. *Eucrepis* §2. *Fusifformes* Boiss. Fl. or. III (1875) 831, p. min. p.—*Crepis* sect. *Eucrepis* § 3. *Praemorsae* Boiss. *ibid.* (1875) 831 p. p. *Crepis* sect. *Catonia* O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. min. p.—*Crepis* subgen. *Crepis* Schmalh. Fl. II (1897) 152 p. p.—*Crepis* sect. *Desiphylion* Bab. in Univ. Calif. Publ. Bot. 22 (1947) 209 (The Genus *Crepis*, 2).—Plants perennial, rhizomatous, pubescent, sub-glabrous, less often glabrous. Caudex leafy, one-stemmed. Stem erect, hard, (20)30–150 cm high, with few heads, leafy. Basal and lower cauline leaves large, toothed or almost pinnatifid, petiolate, middle and upper cauline leaves gradually reducing, sessile. Capitula large or medium, many-flowered, aggregated in corymbose inflorescence. Outer involucre bracts two-thirds to one-third as long as inner; inner bracts glabrous on the inside, hardly changed at fruiting. Receptacle glabrous or foveolate and ciliolate. Corolla 12–26(28) mm long, corolla tube 3–8 mm long, mostly weakly pubescent with rather long and thin or short acicular hairs, sometimes glabrous. Achenes similar, reddish-brown or yellowish, 4–10 mm long, fusiform or columelliform, more or less narrowed at both ends, without beak, with 10–20 and more longitudinal ribs; pappus whitish or yellowish, 6–10 mm long.

Type (lectotype) of section: *C. sibirica* L.

1. *C. sibirica* L. Sp. pl. (1753) 807; M.B. Fl. taur.-cauc. II, 256; Froel. in Dc. Prodr. VII, 1, 167; Ldb. Fl. Ross. II, 2, 828; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3, (1848) 113 (Fl. baic.-dahur.); Boiss. Fl. or. III, 833; Schmalh. Fl. II, 155; Lipsky, Fl. Kavk, 373; Syreistsch. III, Fl. Mosk. Gub. III, 340; Fedtsch. and Fler. Fl. Evrop. Ross. 1060; O. and B. Fedtsch. Perech. Rast. Turk. IV, 345; Hegi, Ill. Fl. VI, 2 1137; Grossh. Fl. Kavk. IV (1934) 263 and Opred. Rast. Kavk. (1949) 519; Krascheninn. in Fl. Yugo-Vost. VI, 472; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 223 (The Genus *Crepis* 2); Kryl. Fl. Zap. Sib. XI, 3038; Kolak. Fl. Abkhazii, IV, 307; Klovov in Vizn. Rosl. URSR, 595; Papava in Fl. Gruzii, VIII, 702; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 748; Majeovski, Fl. ed. 8, 635; Karavaev, Konsp. Fl. Yakutii, 179; Dostal. Klič (1958) 634; Popov. Fl. Sredn. Sib. II, 782; Kamenskaya, Opred. Vyssh. Rast. Karelii. 432; Asker. in Fl. Azerb. VIII, 568; Kovalevskaya in Fl. Uzb, VI, 494.—*C. ruprechtii* Boiss. Fl. or. III (1875) 843; Lipsky, l. c.; Grossh. op. cit. (1934) 263 and (1949) 519.—*C. paludosa* auct. p. min. p. non. Moench: Bab. op. cit. (1947) 232.—*Hieracium sibiricum* (L.) Lam. Encycl. meth. II (1786) 368; Ldb. Fl. alt. IV, 135.—*Sonchus caucasicus* Biehl. Pl. nov. herb. Spreng. Cent. (1807) 12; Spreng. Fl. Hal. Mant. I (1807) 49; DC. Prodr. VII, 1, 189.—*S. flexuosus* Ldb. Ind. pl. hort. Dorpat. Suppl. (1811) 5, n. v.; DC. op. cit. 189.—*Soyeria sibirica* (L.) Monn. Ess. monogr. Hierac. (1829) 77.—*Hapalostephium sibiricum* (L.) D. Don in Edinb. New Phil. Journ. (1829) 308.—*Lepicaune sibirica* (L.) C. Koch. in Linnaea, XXIII (1850) 683.—*Aracium sibiricum* (L.) Sch. Bip. in Jahresbericht Pollichia XXII-XXIV (1826) 319; Herd. in Bull. Soc. Nat. Mosc. XLIII, 2 (1870) 213.—*Hieracioides sibiricum* (L.) O. Ktze. Rev. gen. I (1891) 346, "*Hieracioides*".—*H. ruprechtii* (Boiss.) O. Ktze. ibid. (1891) 346, "*Hieracioides*".—*Ic.*: Gmel. Fl. Sibirica II (1749) t. X; Syreistsch. loc. cit.; Hegi, op. cit. Fig. 811; Javorka and Csapody, Iconogr. Fl. Hung. 566, fig. 4060; Kraschen. op. cit. Fig. 723; Bab. op. cit. fig. 13; Dostal, op. cit. t. 221, fig. 2163.—*Exs.*: GRF No. 675; Herb. Fl. Ingr. No. 362b; Pl. Finl. exs. No. 400; Domin and Krajina, Fl. Cechosl. exs. No. 399; Fl. exs. austro-hung. No. 3041; Schultz, Herb. norm. nov. ser. cent. 21, No. 2018; Fl. exs. reip. Bohem.-Slov. No. 985.

Perennial. Rhizome short, thick, woody, with somewhat thick roots. Stem one, 50–150 cm high, thick, erect, straight or slightly flexuous, ribbed-sulcate, sparsely branched above, less often simple, leafy, including leaves covered with isolated or rather dense, longer, pale, less often almost black, eglandular, and flexuous glandular hairs beneath (mostly on veins), mixed above with arachnoid tomentum. Leaves slightly rugose, oblongly elliptical, oblong-ovate or ovate, acute to acuminate, irregularly sinuate-

toothed; basal and lower cauline leaves abruptly narrowed into wide-winged petiole, petiole with large teeth along margin or almost pinnatilobate, as long as or shorter than lamina, leaves large, to 40 cm long (including petiole) and to 10–13 cm wide; middle cauline leaves with short broad-winged petiole amplexicaul or as also upper cauline leaves sessile, leaves with wide cordate amplexicaul base, apical leaves strongly reduced, oblong- or linear-lanceolate, entire. Capitula few, in corymbose inflorescence on very slightly bulged, thickish peduncles. Involucre campanulate, 13–16 mm long and 9–10(12) mm wide (at beginning of flowering); involucre bracts with rather dense, long, eglandular, stiff hairs on the outside along midrib or glabrous, densely hairy along the upper margin, dark-, less often pale green, in the middle with black, narrow longitudinal stripe, glabrous on the inside; outer involucre bracts 12–16, of equal length, oblong or oblong-lanceolate, 610 subacute, with white scarious border (innermost), scarcely thickened at the base at fruiting. Receptacle convex, foveolate, walls of fovea membranous, torn, ciliolate. Florets yellow, two times as long as involucre. Corolla 20–26(28) mm long; ligules to 2.5 mm wide; corolla tube 6–8 mm long, pubescent from more or less scattered, less often dense, longer hyaline hairs. Style branches yellow. Achenes all alike, reddish-brown, 7.5–10.0 mm long and 1.1–1.3 mm wide, fusiform somewhat strongly narrowed toward the apex, straight or curved, with 20 (and more) slender rounded ribs, reaching slightly short of the achene apex and bearing very minute (under very high magnification) erect, spinescent hairs, pappus 8–10 mm long, yellowish-white. Chromosomes $2n = 10$. Flowering July to August.

Sparse coniferous and mixed forests, birch and oak groves, forest edges and glades, scrubs, meadows; mountain forests of upper mountain zone and subalpine meadows, up to 2,700–2,950 m.—*Arctic*: Arctic Europe (Nes, Pesh, Indiga rivers near villages of Popovykh, Belaya, Shapkina; lower reaches of Pechora: village of Khongurei); *European Part*: Dvina-Pechora, Ladoga-Ilmen (rarely in east, also near village of Koporya, Leningrad Region), Volga-Kama, Upper Volga, Trans-Volga, Volga-Don, Middle Dnieper, Upper Dnieper (south), Lower Don (vicinity of Saratov); *Caucasus*: Ciscaucasia (Caucasian Reserve; Teberda; Kislovodsk; Balkaria), Dagestan, Eastern Transcaucasia (Shakhdag Mountain in Kuba District; Bakuriani, Dzhavakhetia), Western Transcaucasia (Gagrin Range; Pshegishkha, Akh-Ag and Shlik mountains), Southern Transcaucasia (northern part); *Western Siberia*: Ob' Region, Upper Tobol (northern part), Irtysh, Altai, *Eastern Siberia*: Yenisei, Angara-Sayans, Lena-Kolyma (southwestern part), Dauria; *Soviet Central Asia*: Dzhungaria-Tarbagatai, Tien Shan, Pamiro-Alai. *General distribution*: central Europe (western Carpathians, Sudeten), Dzhungaria-Kashgaria, Mongolia (northern part). Described from Siberia. Type in Leningrad.

Note. In his monograph of the genus *Crepis* L., Babcock (l. c.), not having seen the type specimen of *C. ruprechtii* Boiss., identified this species with *C. paludosa* (L.) Moench without any justification, although the author of the species, Boissier (l. c.), in his original description, very correctly related it to *C. sibirica* L. An examination of the single type specimen of *C. ruprechtii* Boiss., preserved in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad, convinced me that Boissier described the smaller, apparently non-hereditary form of *C. sibirica* L., as a separate species.

Two varieties are distinguished: *C. sibirica* L. var. *hispidissima* Sosn. ex Grossh. *Fl. Kavk.* IV (1934) 263 (*C. sibirica* var. *turkestanica* Winkl. ex O. and B. Fedtsch. op. cit. (1911) 346, nomen)—with hispid involucre bracts, and var. *sibirica* (*C. sibirica* var. *glabrescens* Winkl. ex O. and B. Fedtsch., op. cit. (1911) 346, nomen)—with glabrous involucre bracts. Since both forms are found throughout the range of the species, they hardly merit recognition.

2. **C. paludosa** (L.) Moench, Meth. (1794) 535; Froel. in DC. Prodr. VII, 1, 170; Ldb. Fl. Ross. II, 2, 829; Schmalh. Fl. II, 155; Syreistsch. 611 III. Fl. Mosk. Gub. III, 339; Fedtsch. and Fler. Fl. Evrop. Ross. 1061; Hegi, Ill. Fl. VI, 2, 1153; Kraschen. in Fl. Yugo-Vost. VI, 472; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 232, p. p. (The Genus *Crepis*, 2); Kryl. Fl. Zap. Sib. XI, 3040; Popov, Ocherk Rast. i Fl. Karpat 257; Klokov in Vizn. Rosl. URSR, 595; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 748; Majewski, Fl. ed. 8, 635; Dostal. Klič (1958) 636; Ramenskaya, Oprod. Vyssh. Rast. Karelii 432.—*Hieracium paludosum* L. Sp. pl. (1753) 803.—*H. paniculatum* Gilib. Fl. Lithuan. III (1781) 236, n. v. and Exerc. phytol. I (1972) 190.—*Aracium paludosum* (L.) Monn. Ess. monogr. Hierac. (1829) 73.—*Geracium paludosum* (L.) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1368 and Fl. germ. excurs. I (1830) 260.—*Hapalostephium paludosum* (L.) D. Don in Edinb. New Phil. Journ. (1829) 308.—*Barkhausia paludosa* (L.) Baumg. ex DC. op. cit. (1838) 170, pro syn.—*Soyeria paludosa* (L.) Godr. Fl. Lorr. ed. 1, II (1843–1844) 72.—*Hieracioides paludosum* (L.) Rupr. Fl. Ingr. I (1860) 630; Ktze. Rev. geb. I (1891) 346; “*Hieraciodes*”.—*Lim-ocrepis paludosa* (L.) Fourr. in Ann. Soc. Linn. Lyon. nouv. ser. XVII (1869) 104.—**Ic.**: Syreistsch. op. cit. 340; Hegi, op. cit. Taf. 278, Fig. 4 (color); Javorka and Csapody, Iconogr. Fl. Hung. 564, fig. 4052; Babc. op. cit. fig. 16; Szaf. Kulcz. Pawl. op. cit. fig. 1658; Dostal, op. cit. t. 222, fig. 2168.—**Exs.**: GRF No. 722' Herb. Fl. Ingr. No. 362; Woloszczak, Fl. polon. exs. No. 451, pl. Finl. exs. No. 399; Fl. exs. reip. Bohem-Slov. No. 385; Hayek, Fl. stir. exs. Nos. 800, 1093; Petrak, Fl. Bohem. and Morav. exs. No. 200; Reliq. Maillean. No. 1366; Domin, Pl. Bohem. exs. sine numero; Fellman, Pl. Arct. No. 151.

Perennial. Rhizome short, woody, vertical or oblique, with numerous slender roots. Stem single, 30–100 cm high, erect, ribbed-sulcate, sparsely branched above, very rarely simple, loosely leafy, usually reddish-violet at the base; glabrous like thin leaves. Basal and lower cauline leaves 8–28 cm long (including petiole) and 2.5–5.0(6.0) cm wide, oblong-obovate, oblong-oblancheolate or oblanceolate, obtuse to acuminate, sinuate-toothed, with unequal, deflexed or straight teeth or even lobes, often almost pinnatipartite in the lower half, gradually narrowed into winged petiole, petiole as long as or half or less than half as long as lamina; middle cauline leaves from sublancheolate to oblong-ovately lanceolate, mostly curved-acuminate at the apex, with remote small teeth or sinuate-toothed, sessile, sagittate, less often cordate, amplexicaul, sometimes with very short wide-winged, sagittately amplexicaul petiole, apical leaves strongly reduced, linear. Capitula fewer, in lax corymbose inflorescence, on very slightly bent slender peduncles. Involucre narrowly campanulate, 10–12 mm long and 4–6(7) mm wide (at beginning of flowering); involucre bracts on midrib on the outside, sometimes upper part of peduncles and apical leaves with more or less dense, rather long, almost black, glandular
 612 stiff hairs, hairy on the upper margin, dark green, with narrow, black longitudinal stripe in the middle, glabrous on the inside; outer involucre bracts 8–10, of unequal length, deltoid- or oblong-lanceolate, acute, without scarious border, one-third as long as inner bracts; inner bracts 12–18, of equal length, linear-lanceolate, acute to acuminate, without scarious border, slightly keeled at the base at fruiting. Receptacle convex, pitted, glabrous or foveolate, walls of pits membranous, smooth above. Florets yellow, one and one-half to two times as long as involucre. Corolla 13–16(18) mm long; ligule 1.5–2.0(2.3) mm wide; corolla tube 3–4 mm long, glabrous or pubescent with sparse, very short, acicular hyaline hairs. Style branches covered with very fine black spiny hairs on the outside. Achenes all alike, yellowish, 4.5–5.0 mm long and about 0.75 mm wide, columelliform, very slightly narrowed toward the apex, straight, with 10 slender rounded, smooth ribs reaching the apex of achenes; pappus 6–7 mm long, whitish, with weak yellowish tinge. Chromosomes $2n = 12$. Flowering July to August.

Wet forest meadows, swamps, swampy forests and scrubs, wet banks of rivers and streams.—*European Part*: Karelia-Lapland, Ladoga-Ilmen, Dvina-Pechora, Volga-Kama, Baltic Region, Upper Dnieper, Upper Dniester, Upper Volga, Volga-Don (northern part); *Western Siberia*: Upper Tobol (former Troits District). *General distribution*: Scandinavia, central and Atlantic Europe, Balkans (vicinity of Sofia, Rhodope). Described from northern Europe. Type in London.

3. **C. caucasia** C.A.M. in Mém. Acad. Sc. Pétersb. ser. VI, Sc. Nat. VII (1855) 15; Grossh. Fl. Kavk. IV (1934) 263 and Opred. Rast. Kavk.

519; *Papava* in Fl. Gruzii, VIII, 702.—*C. rumicifolia* Boiss. Fl. or. III (1875) 843; Grossh. op. cit. (1934) 263, p. p.—*C. glabra* Boiss. op. cit. (1875) 843, p. p.; Lipsky, Fl. Kavk. 373, p. p.—*C. paludosa* var. *caucasica* Somm. and Lev. in Tr. Peterb. Bot. Sada, XVI (1900) 298, p. p.; Lipsky, op. cit. Dop. 1, 66, p. p.—*C. paludosa* auct. p. min. p. non Moench: Babc. in Univ. Calif. Publ. Bot. 22 (1947) 232 (The Genus *Crepis*, 2).—*Hieracioides caasicum* (C.A.M.) O. Ktze. Rev. gen. I (1891) 345, "*Hieracioides*".—*H. rumicifolium* (Boiss.) O. Ktze. ibid. (1891) 346.—*H. glabrum* (Boiss.) O. Ktze, ibid. (1891) 346, p. p.—**Ис.**: *Papava*, op. cit. Fig. 442.

- Perennial. Plant, except scarcely arachnoid-hairy upper part of peduncles entirely glabrous. Rhizome short, woody, vertical or oblique, with numerous slender roots. Stem single, 25–70(90) cm long, erect, straight, ribbed-sulcate, sparsely branched above, very rarely simple, sparingly leafy, reddish-violet often at the base. Leaves thin, mostly with remote teeth or finely sinuate-toothed, with unequal deflexed or straight denticles or teeth. Basal and lower cauline leaves oblong-obovate, elliptical or oblong-ob lanceolate, obtuse or acute, narrowed into winged petiole, half or less as long as lamina, middle cauline leaves ovate, oblongly
- 613 ovate, oblong-ovate-lanceolate, less often oblong-lanceolate, subacute to acuminate, with some, sometimes all lower cauline leaves sessile, with broad cordate amplexicaul base, apical leaves strongly reduced, linear. Capitula fewer, in lax corymbose inflorescence on slightly curved, scabrous, peduncles slightly thickened below capitula. Involucre campanulate (10)11–13 mm long and 6–8 mm wide (at beginning of flowering); involucre bracts glabrous on the outside as also inside, hairy on the upper margin, dark green with narrow black longitudinal stripe in the middle, without scarious border; outer involucre bracts 10, of unequal length, triangular or oblong-lanceolate, acute, half to one-third as long as inner; inner bracts (16)18–20, of equal length or very slightly unequal, linear-lanceolate, acute or acuminate, slightly keeled on the back at fruiting. Receptacle convex, pitted, glabrous or foveolate, walls of pits membranous, smooth above. Florets yellow, one and one-half to two times as long as involucre. Corolla 15–20 mm long; ligules 1.5–2.5 mm wide, corolla tube 3–4 mm long; glabrous or sparsely pubescent with very short acicular hyaline hairs. Style branches covered with fine black spiny hairs on the outside, Achenes all alike, yellowish, 4.5–5.5 mm long and about 0.74 mm wide, columelliform, slightly narrowed toward the apex, straight, with 10 slender, rounded, smooth ribs reaching the achene apex; pappus 6–7 mm long, whitish with weakly yellowish tinge. Flowering July to August.

Forests of upper forest zone and subalpine meadows, up to 2,800 m.—*Caucasus*: Ciscaucasia (Teberda, Balkaria, Digoria), Eastern Transcaucasia (southern Ossetia—in the east up to Tushetia, Trialet Range).

Western Transcaucasia (Agurepsta River—a tributary of Bzyb River in Abkhazia, Upper Adzharia), *General distribution*: Asia Minor (Lzistan). Described from Baidara River (central Caucasus). Type in Leningrad.

Note. It differs from the very close *C. paludosa* (L.) Moench by thicker peduncles, broader campanulate involucre, entirely glabrous involucre bracts, ovate, oblong-ovate or oblong-ovate-lanceolate, sessile, basally broadly cordate amplexicaul (and not sublanceolate, oblong-lanceolate, rarely oblong-ovate-lanceolate, sessile, sagittate or very short-winged petiole) cauline leaves and shorter petiole, serrulate or finely sinuate-toothed basal and lower cauline leaves.

4. **C. glabra** Boiss. Fl. or. III (1875) 843, p. p.; Lipsky, Fl. Kavk. 373, p.p.—*C. rumicifolia* var. *glandulosa* Alb. Prodr. Fl. Colch. (1875) 153; Lipsky, l. c.; Grossh. Fl. Kavk. IV (1934) 263.—*C. paludosa* var. *caucasica* Somm. and Lev. in Tr. Peterb. Bot. Sada, XVI (1900) 298, p. p.; Lipsky, op. cit. Dop. 1, 66, p. p. non *C. caucasica* C.A.M.—*C. rumicifolia* auct. non Boiss.; Kolak. Fl. Abkhazii IV (1949) 309; Grossh. Opred. Rast. Kavk. 519, p. p.; Papava in Gruzii, VIII, 702.—*Hieracioides glabrum* (Boiss.) O. Ktze. Rev. gen. I (1891) 346, p. p. "*Hieracioides*".

Perennial. Rhizome short, woody, vertical or oblique, with numerous slender roots. Stem single, (20)30–60(80) cm high, erect, straight or somewhat flexuous, ribbed-sulcate, sparsely branched above, less often simple, sparsely leafy, sometimes slightly reddish-violet at the base, as also thin leaves, with remote teeth or finely sinuate-toothed, glabrous. Basal and lowermost cauline leaves oblong-obovate, oblong-elliptical or oblong-oblancheolate, obtuse to acute, rather abruptly narrowed into narrow-winged petiole, usually half or less as long as lamina; middle cauline leaves mostly oblongly ovate, ovate-lanceolate or oblong-lanceolate, acute or slightly curved-acuminate, with some lower cauline leaves sessile, with broad cordate or sagittate amplexicaul base, apical leaves strongly reduced, linear. Capitula fewer, in lax corymbose-inflorescence, on slightly bent scabrous peduncles. Involucre campanulate, 10–11 mm long and 6–7 mm wide (at beginning of flowering); involucre bracts on midrib on the outside, sometimes the upper part of peduncles and apical leaves with more or less dense, rather long, black, glandular stiff hairs, hairy on upper margin, dark green in middle with narrow black longitudinal stripe, without membranous border, glabrous on inner surface; outer involucre bracts 10, of unequal length, deltoid or oblong-lanceolate, acute, one-third to half as long as inner bracts; inner bracts (16)18–20, of equal length or very slightly unequal, linear-lanceolate, acute or acuminate, slightly keeled on the back at fruiting. Receptacle convex, scarcely pitted, glabrous or foveolate, walls of pit membranous, smooth above. Florets yellow, one and one-half to two times as long as involucre. Corolla 12–16 mm long;

ligules to 2.5 mm long; corolla tube 3–4 mm long, glabrous or pubescent with sparse, very short acicular hyaline hairs. Style branches as in the preceding two species. Achenes alike, yellowish, 4.5–5.0 mm long and about 0.75 mm wide, columelliform, slightly narrowed toward apex, straight with 10 slender, rounded, smooth ribs reaching apex of achene; pappus 6–7 mm long, whitish with yellow tinge. Flowering July to August.

Birch forests and subalpine meadows.—*Caucasus*: Ciscaucasia (in the Main range from Fisht Mountain to Balkaria), Eastern Transcaucasia (central Caucasus), Western Transcaucasia (Abkhazia, Svanetia), Described from Baidara River and Mamison Mountains (central Caucasus). Type (lectotype) in Leningrad.

Note. It is identical in appearance with *C. caucasica* C.A.M. but differs from it by having the involucre bracts hispid, glandular-hairy on the outer side and occasionally on the peduncles (in the upper part) and the apical leaves. In its characters, *C. glabra* Boiss. is intermediate between 615 *C. paludosa* (L.) Moench and *C. caucasica* C.A.M.

Section 2. Succisocrepis Sch. Bip. ex Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 248, 308, p. p.—*Calliopea* D. Don in Edinb. New Phil. Journ. (1829) 309.—*Crepis* d. *Catonia* Rchb. Fl. germ. excurs. I (1830) 258, p. min. p. descr. and in Moessl. Handb. ed. 2, II, 2 (1829) 1402, p. min. p. nomen.—*Crepis* sect. *Hapalostephium* (D. Don) Froel. in DC. Prodr. VII, 1 (1838) 165, p. min. p.—*Crepis* sect. *Hieracioides* Froel. in DC. ibid. (1838) 167, p. min. p.—*Crepis* sect. *Crepis* §1 Koch, Synops. ed. 2, 2 (1844) 502, p. min. p.—*Crepis* sect. *Crepis*. §2 Koch, ibid. (1844) 506, p. p.—*Crepis* sect. *Intybus* (Fries) Bisch. op. cit. (1851) 247, 284, p. min. p.—*Herinia* subgen. *Melanoberinia* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 316, p. min. p.—*Berinia* subgen. *Succisoberinia* Sch. Bip. ibid. (1866) 318.—*Omalocline* B. *Dichroopappus* Sch. Bip. ibid. (1866) 320.—*Crepis* sect. *Omalocline* (Cass.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515 p. min. p.—*Crepis* sect. *Eucrepis* §3 *Praemorsae* Boiss. Fl. or. III (1875) 831, p. min. p.—*Crepis* sect. *Catonia* O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. min. p.—*Crepis* sect. *Brachypodes* Bab. in Univ. Calif. Publ. Bot. 22 (1947) 210 (The Genus *Crepis* 2).—Perennial, pubescent plants. Rhizome short, vertical or oblique, obtuse with numerous slender roots. Stem one to three, erect or slightly ascending, slender to more or less thick, 3–25 cm high, simple or with one or two (three) branches, sparsely leafy. Basal leaves numerous, oblanceolate, elliptical-oblanceolate to oblong-obovate, remotely small toothed to pinnatilobate, less often subentire, petiolate; cauline leaves one to three, smaller, ovate-lanceolate, oblong or linear, sessile. Capitula medium or rather large, with many florets, one to three (four) on stem.

Outer involucre bracts half to two-thirds as long as inner; inner bracts appressed hairy on the inside. Receptacle foveolate, ciliolate-fimbriate or tuberculate, glabrous. Corolla 12–22 mm long; corolla tube 3–8 mm long, scatteredly pubescent with short hairs, less often glabrous. Achenes all alike, dark reddish-brown or reddish to reddish-brown, 4–10 mm long and 0.5–1.0 mm wide, fusiform, strongly narrowed toward the apex, without beak, with (10)12–17 longitudinal ribs; pappus white, 4–8 mm long.

Type (lectotype) of section: *C. terglouensis* (Hacq.) Kerner.

5. ***C. hokkaidoensis*** Bab. in Univ. Calif. Publ. Bot. 19 (1941) 400 and 22 (1947) 258 (The Genus *Crepis*, 2); Hara, Enum. Sper. Jap. II, 191; Kitamura in Mem. Coll. Sc. Univ. Kyoto, Serv. B, XXII, 1 (1955) 104; Tolmatchev in Rebristaya, Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 414, 415.—*C. sp. an burejensis* m.? Fr. Schmidt in Mém. Acad. Sc. Pétersb. ser. VII, XII, 2 (1868) 154.—*C. burejensis* auct. non Fr. Schmidt. (ibid. 52); Miyabe and Miyake, Fl. Saghal. (1915) 616 284; Miyabe and Kudo in Trans. Sapp. Nat. Hist. Soc. V (1915) 150; Kitamura in Acta Phytotax. et Geobot. I (1932) 117; Hara in Tokyo Bot. Mag. LII (1938) 70.—*C. miyabei* Tatewaki and Kitamura in Acta Phytotax. et Geobot. XI, 2 (1942) 121.—*C. chrysantha* auct. non Turcz.: Vorobev in Tr. Dalnevost. Fil. Ser. Bot. III(V) (1956) 76 (Mater. k Fl. Kurilskikh Ostrovov).—**lc.**: Miyabe and Miyake, op. cit. pl. IX, fig. 1–2; Takeda, Kozanshokubutsu-dui, ed. 2 (1937) pl. 14; Bab. op. cit. (1947) fig. 26; Hara, Enum. Sper. Jap. II (1952) pl. IV, fig. 5, 5; Tolmatchev and Rebristaya, op. cit. Fig. 7.

Perennial. Rhizome short, 5–6 mm thick, vertical or oblique, with numerous slender roots, covered above with dark brown remnants of petioles of dead leaves, simple. Stems one or two, 8–25 cm high, more or less thick, straight or strongly arcuate, ribbed-sulcate, hollow, with one or two(three) branches, less often simple, sparsely leafy, green, weakly thickened below capitula, with long, lax, woolly-arachnoid hairs all over, in addition covered with fewer short glandular hairs mixed with long, erect, slightly flexuous eglandular hairs, initially mostly scattered, pale, more dense, dark hairs below capitula. Leaves covered with more or less scattered hairs on both surfaces, hairs short, pale glandular, stiff, sometimes beneath along midrib and margin (mostly cauline leaves), with very scarce long eglandular hairs; basal leaves numerous, oblanceolate or elliptical-oblanceolate, obtuse to acute, irregularly toothed or shallow pinnatilobate with approximate or remote deltoid acute teeth or lobes, gradually narrowed into narrow-winged petiole, shorter than lamina; cauline leaves one to three, 3–7 cm long, oblong, oblong or ovate-lanceolate, subobtuse to a cute, irregularly toothed or pinnatilobate, sessile, slightly amplexicauc; apical leaves usually strongly reduced, entire. Capitula one to three(four)

per stem, erect, medium. Involucre campanulate, 12–14 mm long and 10–12 mm wide (at flowering time); involucral bracts oblong-lanceolate, acute, scarcely arachnoid-hairy on the outside, covered with dense and long yellowish-green eglandular hairs mixed with short glandular hairs, on the upper margin whitish crisped-hairy; outer involucral bracts of unequal length, without scarious border, half to two-thirds as long as inner; inner bracts of equal length, with narrow scarious border, with dense appressed hairs on the inside. Receptacle foveolate, ciliolate-fimbriate. Florets yellow, one and one-half to two times as long as involucre. Corolla 14–17 mm long, corolla tube 3–4 mm long; scatteredly pubescent with very short coarse hairs. Style branches dark green. Immature achenes all alike, dark reddish-brown, 7.5–10.0 mm long and 617 0.7–0.8 mm wide, oblong, strongly narrowed toward the apex with numerous (about 20) narrow rounded ribs, covered with very fine (visible under high magnification!) erect spiny hairs; pappus 5–6 mm long, white, persistent. Chromosomes $2n = 8$. Flowering July to August.

Stony and rubbly slopes.—*Far East*: Sakhalin (south, Moneron Island, Shumshu Island, reported from Shikotan, Iturup Islands in Kuril Ridge). *General distribution*: Japan (Hokkaido and Risiri islands). Described from Hokkaido. Type in Berkeley, California.

Note. The redescription of this species under the name *C. miyabei* Tatewaki and Kitamura remained unknown to Babcock, the author of the monograph of the genus *Crepis* L.

6. *C. chrysantha* (Ldb.) Turcz. in Bull. Soc. Nat. Mosc. XI (1838) 96 (Cat. baic. No. 710), XXI, 3 (1848) 112 (Fl. baic.-dahur.); Froel. in DC. Prodr. VII, 1, 165; Ldb. Fl. Ross. II, 2, 826; Kryl. Fl. Alt. III, 757 and Fl. Zap. Sib. XI, 3035; Fedtsch. and Fler. Fl. Evrop. Ross. 1060; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 263, p. max. p. (The Genus *Crepis*, 2); Stank. and Tal. Opređ. Vyssh. Rast. ed. 1, 699; Karavaev, Konsp. Fl. Yakut. 179; Popov, Fl. Sredn. Sib. II, 781.—*Hieracium chrysanthum* Ldb. Fl. alt. IV (1833) 129.—*H. frigidum* Stev. ex DC. op. cit. (1838) 165, pro syn.; Turcz. ex Ldb. Fl. Ross. II. 12 (1846) 826, pro syn.—*Soyeria chrysantha* (Ldb.) D. Dietr. Synops. pl. IV (1847) 1331.—*Berinia chrysantha* (Ldb.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV. (1866) 319.—*Hieracioides chrysanthum* (Ldb.) O. Ktze. Rev. gen. I (1891) 345, “*Hieraciodes*”.—**lc.**: Ldb. Ic. pl. Fl. Ross. V, t. 456; Babc. op. cit. fig. 28 and pl. 3.

Perennial. Rhizome short, slender, vertical or oblique with numerous slender roots, covered above with dark brown remnants of petioles of dead leaves, simple, less often sparsely short branched near the apex. Stem mostly one to three, (5)8–25 cm high, somewhat slender, straight or not very strongly arcuate, finely ribbed, sulcate, hollow, simple, less

often with one or two branches, sparsely leafy, green or beneath violet, strongly thickened below capitula, scattered woolly-arachnoid-hairy allover, in the upper part initially covered with scattered, near capitula dense, long, dark- or blackish-green eglandular hairs, usually mixed with few short glandular hairs, often glabrous in the lower half. Basal leaves numerous, 12.0–14.0(16.5) cm long (including petiole) and 0.5–2.0(2.5) cm wide, oblong-obovate, oblong-oblanceolate or oblanceolate, obtuse to subacute, sometimes acute, with remote small teeth, sinuate-toothed or subentire, very rarely shallow divided into deltoid distant lobes, gradually narrowed into narrowly winged petiole, petiole almost as long as or shorter than lamina, glabrous or weakly and lax arachnoid-hairy above, usually glabrous beneath; cauline leaves (one) two or three, smaller, oblong, oblong-lanceolate or sublinear, subobtuse to acute, entire or with remotely small toothed, narrowed toward the base, sessile, not amplexicaul, glabrous or weakly and lax arachnoid-hairy, sometimes
 618 upper cauline leaves pubescent with sparse, long, eglandular hairs beneath along midrib. Capitulum single (less often two or three on stem), erect, rather large. Involucre campanulate, 12–14 mm long and 8–12 mm wide (at flowering time); involucre bracts linear-lanceolate, obtuse or acute, covered with dense and long dark green or blackish, eglandular hairs on the outside, mixed with short glandular hairs, whitish crisped hairy along the upper margin; outer involucre bracts of unequal length, without scarious border, half to two-thirds as long as inner; inner bracts of equal length, with narrow scarious border, appressed hairy on the inside, receptacle foveolate, ciliolate-fimbriate. Florets yellow, one and one-half to two times as long as involucre. Corolla 13–20 mm long; ligules to 3 mm wide, corolla tube 4–5 mm long, pubescent with scattered short papillose hairs. Style branches yellow. Achenes all alike, dark reddish-reddish brown, 6.0–8.5 mm long and 0.7–1.0 mm wide, fusiform, strongly narrowed toward the apex, straight or slightly curved, with (10)12–13, narrow, rounded ribs, covered with very small (under very high magnification!), erect spiny hairs, pappus 5 mm long, white, persistent. Chromosomes $2n = 8$. Flowering July to August.

Tundra, rocks, stony and rubbly slopes, less often in alpine meadows; in Arctic and alpine mountain zones.—*Arctic*: Arctic Siberia (including Polar Urals), Chukotka, Anadyr; *European Part*: Dvina-Pechora (eastern part), Volga-Kama (Urals, in south up to Iremel Mountains); *Western Siberia*: Ob' Region (northern part), Altai; *Eastern Siberia*: Yenisei (northern part), Angara-Sayans (Kuznetsk Alatau, Sayans), Dauria (mountains and the eastern coast of Lake Baikal), Lena-Kolyma (northern part and Yablonov, Stanovoi, Dzhutdzhur ranges); *Far East*: Zeya-Bureya (Stanovoi Range), Okhota (Dzhutdzhur Range), Kamchatka; *Soviet Central Asia*: Dzhungaria-Tarbagatai (Tarbagatai). *General*

distribution: Mongolia (northern part.) Described from Altai. Type in Leningrad.

Note. There are reports in the literature about *C. chrysantha* (Ldb.) Turcz. growing on Sokhodno Mountain in the Chita Region. In the Herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad, one specimen from this mountain was preserved with the above name, which after a careful study was assigned to *C. polytricha* (Ldb.) Turcz.

The varieties recognized on the basis of the degree of incision of the lamina in *C. chrysantha* (Ldb.) Turcz.—var. *tubaeformis* Ldb., var. *minor* Ldb. (= *C. chrysantha* f. *incisa* Kryl.) and var. *integrifolia* (Kryl.) Schischk. (= *C. chrysantha* f. *integrifolia* Kryl.)—apparently do not have taxonomic significance.

7. ***C. burejensis*** Fr. Schmidt in Mém. Acad. Sc. Pétersb. ser. VII, XII, 2 (1868) 52; Kom. and Alis. Opred. Rast. Dalnevost, Kraya II, 1101; Tolmatchev and Rebristaya in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI 414.—*C. chrysantha* auct. p. min. p. non Turcz.: Bab. in Univ. Calif. Publ. Bot. 22 (1947) 263 (The Genus *Crepis*, 2).—**lc.**: Tolmatchev and Rebristaya, op. cit. Fig. 6 on p. 413.

Perennial. Rhizome short, slender, vertical or oblique with very slender roots, covered above with dark brown remnants of petioles of dead leaves, simple. Stems one or two, 6–18 cm high, slender, well-proportioned, straight or slightly flexuous, hollow, simple or with one or two branches, sparsely leafy, green, weakly thickened below capitula, sparsely arachnoid-hairy all over, sometimes covered with scattered, long, almost black eglandular hairs above or only below capitula. Basal leaves fewer, 2–8 cm long (including petiole) and (0.3)0.5–1.0 cm wide, ovate or oblong-ob lanceolate to oblanceolate, obtuse to acute, sinuate-toothed or more or less deeply divided into remote, narrow triangular lobes, gradually narrowed to narrowly winged petiole, petiole almost as long as lamina or shorter including cauline leaves glabrous or scarcely arachnoid-hairy on both surfaces; cauline leaves one to three, smaller, linear, less often narrowly lanceolate, acute, entire, sometimes sinuate-sharp toothed in the lower half along margin, sessile, not amplexicaul; upper cauline leaf bracteiform. Capitula one to three on stem, erect, medium. Involucre narrowly campanulate, 9–10 mm long and about 6 mm wide (at flowering time); involucre bracts linear-lanceolate, acute, very slightly arachnoid-hairy on the outside and along midrib covered with scattered, long, almost black eglandular hairs, white crisped hairy along the upper margin; outer involucral bracts of unequal length, without scarious border, half to two-fifths as long as inner; inner bracts of equal length, with narrow scarious border, covered with appressed hairs on

the inside. Receptacle foveolate, walls of pits indistinctly fimbriate above. Florets yellow almost two times as long as involucre. Corolla 12–13 mm long, ligules to 2 mm wide; corolla tube about 3 mm long; scatteredly pubescent with very short hairs. Style branches dark green. Achenes all alike, dark reddish-brown, 6–7(8) mm long, about 0.5–6.0 mm wide, fusiform, considerably strongly narrowed toward the apex, straight, with 13–14 narrow rounded ribs, with very small (visible under very high magnification!) erect spiny hairs; pappus 4–5 mm long, white, persistent. Flowering August.

Mountain tundras.—*Far East*: Zeya-Bureya (Dusse-Alin Range and Gorin-Amgun in northern Amur Region). Endemic. Described from northern Amur Region (upper reaches of Bureya River). Type and topotypes in Leningrad.

Note. I share the view expressed by A.I. Tolmatchev about the separateness of *C. burejensis* Fr. Schmidt. It is well distinguished from *C. chrysantha* (Ldb.) Turcz. by having slender stems, weakly thickened below the capitula, much smaller, narrow-campanulate involucre, involucre bracts that are covered with scattered eglandular hairs on the outside along the midrib, dark green branches, and an isolated range.

- 620 8. ***C. polytricha*** (Ldb.) Turcz. in Bull. Soc. Nat. Mosc. XI (1838) 96 (Cat. baic. No. 712), XXI, 3 (1848) 113 (Fl. baic.-dahur.); Ldb. Fl. Ross. II, 2, 826; Kryl. Fl. Alt. III, 758 and Fl. Zap. Sib. XI, 3036; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 265 (The Genus *Crepis* 2); Popov, Fl. Sredn. Sib. II, 781.—*Hieracium polytrichum* Ldb. Fl. alt. IV (1833) 130.—*M. alpinum* ζ. *polytrichum* (Ldb.) Froel. in DC. Prodr. VII, 1 (1838) 209.—*H. runcinatum* Turcz. ex Ldb. Fl. Ross. II, 2 (1848) 827, pro syn.—*Berinia polytricha* (Ldb.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 317.—*B. chrysantha* var. *polytricha* (Ldb.) Herd. in Bull. Soc. Nat. Mosc. XLIII, 2 (1870) 200.—**Ic.**: Ldb. Ic. pl. Ross. V, t. 461; Babc. op. cit. fig. 29.—**Exs.**: P. Smirnow, Pl. alt. exs. No. 99.

Perennial. Rhizome more or less long, vertical, simple or with few branches, covered above with dense dark brown remnants of petioles of dead leaves. Stems few, less often single, 6–10 cm high, thick, erect or slightly ascending, finely ribbed-sulcate, hollow, branches from middle of lower with one or two erect branches, or simple, sparsely leafy, distinctly thickened below capitula, arachnoid-hairy or whitish finely-tomentose throughout, in addition covered in the upper part, initially with more or less distant, near capitula, rather dense, long, greenish-yellow, less often green, eglandular, stiff hairs, sometimes mixed with few short glandular hairs. Basal leaves numerous, 3–14 cm long and

0.5–2.0 cm wide, oblanceolate or oblong-oblanceolate, runcinate or pinnatilobate with deltoid or narrow oblong-lanceolate, acute, entire remote lobes, gradually narrowed into petiole, petiole almost as long as lamina or shorter, lax arachnoid-hairy on both sides; cauline leaves one to three, similar to basal but sessile and usually smaller. Capitula one to three per stem, erect, rather large. Involucre campanulate, 13–15 mm long and (8)10–12 mm wide (at flowering time); involucre bracts linear-lanceolate, acute, covered on the outside with dense and long greenish-yellowish, eglandular, somewhat stiff hairs mixed with fewer short glandular hairs, whitish finely tomentose in the lower part or allover, whitish crisped hairy along the upper margin; outer involucre bracts of unequal length, without scarious border, two-thirds to half as long as inner; inner bracts of equal length, with narrow scarious border, appressed hairy on the inside. Receptacle foveolate, walls of pits indistinctly fimbriate above. Florets yellow, one and one-half to two times as long as involucre. Corolla 16–22 mm long; ligules up to 3.5–4.0 mm wide. corolla tube 5–8 mm long, pubescent with scattered hairs or glabrous. Style branches yellow. Achenes all alike, blackish-reddish, reddish-brown (immature orange colored), 7–10 mm long and about 1 mm wide, fusiform, somewhat strongly narrowed toward the apex, straight or slightly curved with 13–15 narrow, rounded ribs, covered with very small (visible under high magnification!), erect spiny hairs; pappus 7–8 mm long, white, persistent. Chromosomes $2n = 6$. Flowering July to August.

Stony and rubbly, often limestone slopes, rocks and talus, rubbly banks of mountain brooks; alpine and less often in upper part of montane-forest zone.—*Western Siberia*: Altai (Chuya “Belka*,” Naryn Range); *Eastern Siberia*: Angara-Sayans (eastern Sayans, Pogranichnyi, Uda and Oka ranges, Munku-Sadyk Mountains), Dauria (Sokhodno Mountains). *General distribution*: Mongolia (Mongolian Altai, Munku-Sadyk Mountain, Khangai Range). Described from Altai (Chagan River—a tributary of the Chuya River). Type in Leningrad.

Note. Two varieties are distinguished in this species: var. *legitima* Ldb. (*Fl. Ross.*, II, 2, 826) with an erect, mostly branched, sparsely leafy stem; pinnatilobate, basal and lower cauline leaves and subentire upper leaves; and var. *runcinata* Ldb. (op. cit. 827) with an erect or ascending, single-headed and single-leaved stem; basal leaves almost runcinate, narrowed into petiole; and cauline leaves sessile, pinnatilobate. Apparently these do not have any taxonomic significance.

* Snow covered, flattened mountain summits in Siberia—Translator.

9. *C. czeuensis* Serg. in Sistem. Zam. po Mater. Gerb. Tomsk. Univ. 1-2 (1949) 11; Kryl. Fl. Zap. Sib. XI, 3037.

Perennial. Small plant, 3-7 cm high. Rhizome branched, slender, 2-3 mm thick. Stem solitary, simple, whitish arachnoid hairy, with brown remnants of dead leaves at the base, with one or two linear, acuminate, small leaves. Basal leaves whitish arachnoid-hairy, more strongly so beneath, numerous, 1-3 cm long and 0.6-1.2 cm wide, pinnately incised almost to the base, less often to the middle, lobes lanceolate, deltoid, less often linear (gradually reducing toward leaf base and terminating into teeth), horizontal, often recurved, less often upcurved, undivided or with one to three teeth on each side, of which one usually larger. Capitula solitary (very rarely two). Involucre broad funnel-shaped, 10-15 mm wide; outer involucre bracts linear, inner lanceolate-linear, subobtusate, covered with thin white tomentum, mixed with long glandular appressed hairs, hairs sometimes with very sparse, isolated with very short inconspicuous cilia along the margin, soft hairy at the apex, florets yellow. Mature achenes 4.0-4.5 mm long, black-brown with 16-17 ribs. Flowering July.

Dry rubbly slopes, moraines.—*Western Siberia*: Altai (southeastern part). *General distribution*: Mongolia (between Kosh-Agach and headwaters of Kobdo River). Described from Altai (Chuya steppe between Kosh-Agach and mouth of Bugusun River). Type and paratype in Tomsk.

Note. I have not seen the specimens of *C. czeuensis* Serg. According to A.P. Sergievskaya, the species is more xerophilic than *C. polytricha* (Ldb.) Turcz., from which it differs by having a simple, low (3-7 and not 8-20 cm high) stem, solitary capitula, and smaller dimensions of all its parts.

622 10. *C. karakuschensis* Czer. in Addenda XXVIII, 755.

Perennial. Rhizome short, 5-8(10) mm thick, vertical or oblique with slender cordlike roots, covered with dark brown remnants of petioles of dead leaves, simple or branched above once. Stems one or two(three), 15-28 cm high, erect, slightly flexuous, longitudinally striped, hollow, simple or with one or two lateral branches, leafless or with one or two small linear leaves at the base of branches, green, scarcely thickened below capitula, including leaves more or less densely pubescent with short, glandular pale hairs. All leaves basal, numerous, (5)7-15 cm long (including petiole) and 0.6-2.0 cm wide, lanceolate or oblanceolate, acute, irregularly sinuate-toothed, with narrow deltoid acuminate teeth, gradually narrowed into narrow-winged petiole, petiole as long as lamina or shorter. Capitula one or two(three) per stem, erect, rather large. Involucre campanulate, 12-16 mm long and 7-8(10) mm wide (at

flowering time); involucre bracts on the outside densely covered with mixture of very short glandular, slightly reddish-brown hairs and somewhat long-setaceous, eglandular, whitish-yellowish hairs (except the innermost) ciliolate along margin; outer involucre bracts eight, wide, ovate or oblong lanceolate, acute, of unequal length, two-thirds to half as long as inner; inner bracts 12–16, oblong-lanceolate, acute, of equal length, with scarious border (innermost), glabrous on the inside. Receptacle tuberculate, glabrous. Florets yellow, almost two times as long as involucre. Corolla 13–17 mm long; ligules to 2 mm wide; corolla tube 4.5–6.0 mm long, including the lower part of ligule pubescent with thin flexuous hairs. Style branches yellow. Immature achenes all alike, greenish-yellow, 7.5–8.0 mm long and 0.5–0.7 mm wide, fusiform, slightly narrowed at both ends, ribbed (possibly with 20 ribs), smooth; pappus 7.0–7.5 mm long, white, persistent. Flowering June.

Stony, limestone slopes, about 1,900 m.—*Caucasus*: Southern Transcaucasia (Nakhichevan ASSR, Karakush Mountain near Aznabyurt). Endemic. Described from above locality. Type and its duplicates in Leningrad.

Note. It is similar to the eastern Turkish *C. albiflora* Bab. but differs from it by a taller stem, more or less dense pubescence, and very short, pale, glandular hairs all over the stem; larger, irregularly sinuate-toothed, basal leaves; the involucre bracts densely covered on the outer side with a mixture of very short glandular, slightly reddish-brown hairs and somewhat long, eglandular, whitish-yellowish setaceous hairs; and larger involucre, florets, achenes and pappus.

- Seciton* 3. **Hieracioides** Froel. in DC. Prodr. VII, 1 (1838) 167, valde s. restr.—*Geracium* Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1343, 1367, p. min. p. min. p. and Fl. germ. excurs. I (1830) 259, p. min. p.—*Soyeria* Monn. Ess. monogr. Hierac. (1829) 75, p. min. p.—
 623 *Crepis* sect. *Crepis* §3. Koch, Synops. ed. 2, 2 (1844) 506 p. p.—*Crepis* sect. *Succisocrepis* Sch. Bip. ex Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 248, 308, p. min. p.—*Soyeria* A. *Trachleioracium* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 321, p. max. p.—*Crepis* sect. *Omalocline* (Cass.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515, p. min. p.—*Crepis* sect. *Soyeria* (Monn.) Benth. ibid. (1873) 515, p. min. p.—*Crepis* sect. *Eucrepis* §3 *Praemorsae* Boiss. Fl. or. III (1875) 831, p. min. p.—*Crepis* subgen. *Crepis* Schmalh. Fl. II (1897) 152, p. min. p.—*Crepis* sect. *Mesomeris* Bab. in Univ. Calif. Publ. Bot. 22 (1947) 210 (The Genus *Crepis* 2).—Perennial, rhizomatous, pubescent plants. Caudex leafy, one- or two-stemmed. Stem erect, stiff or thin, (20)30–70(110) cm high, branched in the upper part or from the middle, with fewer capitula, sparsely leafy. Basal and lower cauline leaves

lyrately pinnatisect to entire, petiolate; middle and upper cauline leaves smaller, sessile, amplexicaul, apical leaves bracteal. Capitula small, with many floret, aggregated in lax corymbose inflorescence. Outer involucre bracts one-fourth to one-half as long as inner; inner bracts glabrous on the inside, not thickened on sides at fruiting. Receptacle glabrous or ciliate-fimbriate. Corolla 11–18 mm long with 3–5 mm long tube, pubescent in the upper part with short or somewhat long hairs. Achenes all similar, reddish-brown or dark reddish-brown, 3–4 mm long, cylindrical, slightly narrowed at both ends, without beak, with 15–20 longitudinal ribs; pappus white, 5–7 mm long.

Type (lectotype) of section: *C. lapsanoides* (Gouan) Tausch.

11. *C. lyrata* (L.) Froel. in DC. Prodr. VII, 1 (1838) 170; Ldb. Fl. Ross. II, 2, 829; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 114 (Fl. baic.-dahur.); Kryl. Fl. Alt. III, 760 and Fl. Zap. Sib. XI, 3041; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 278 (The Genus *Crepis* 2); Popov, Fl. Sredn. Sib. II, 781.—*C. hieracioides* auct. non Waldst. and Kit.: Ldb. Fl. alt. IV (1833) 126.—*Hieracium lyratum* L. Sp. pl. (1753) 803; Ldb. op. cit. (1833) 134.—*Soyeria lyrata* (L.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1886) 122.—*Aracium lyratum* (L.) Herd. in Bull. Soc. Nat. Mosc. XLIII, 2 (1870) 214.—*Hieracioides lyratum* (L.) O. Ktze. Rev. gen. I (1891) 346, "*Hieracioides*"—**lc.**: Gmel. Fl. sibirica II (1749) t. IX; Bab. op. cit. fig. 34.—**Exs.**: GRF No. 1370.

Perennial. Rhizome short, slender, obtuse with numerous slender roots. Stem solitary, (20)30–70(110) cm high, erect, straight, ribbed-sulcate, hollow, branched at the apex or in the upper part sparsely leafy, green or violet below, scatteredly pubescent above, densely below capitula with short, black glandular hairs, sometimes mixed with few long eglandular, blackish, setaceous hairs, including this leaves covered with scattered eglandular, whitish, rather stiff hairs below. Basal and lower cauline leaves (5)–8–24(30) cm long (including petiole) and (2)3–624 7 cm wide, oblong-obovate, oblong-ob lanceolate or almost oblanceolate, obtuse, with remote small teeth, sinuate-toothed or lyrate, with large, ovate or oblong-ovate, indistinctly toothed or sinuate-toothed terminal lobe and one to three deltoid or oblong-deltoid, obtuse, less often acute, entire lateral lobes, usually more or less abruptly narrowed into long-winged petiole; middle cauline leaves ovate lanceolate to sub lanceolate, subobtuse or acute, with remote small teeth or sinuate-toothed, abruptly narrowed into short broad petiole, amplexicaul with cordate base or, like the upper cauline leaves, sessile with cordate base, amplexicaul, apical leaves strongly reduced. Capitula in corymbose inflorescence on straight or slightly bent peduncles. Involucre narrow campanulate, 7–9 mm long and 4–8 mm wide (at flowering time); involucre bracts covered

with short glandular black hairs on the outside, sometimes mixed with long eglandular setaceous hairs; crisped hairy along upper margin, dark green; outer involucre bracts 7–10, of unequal length, linear, acute, without scarious border, (half) one-third to one-fourth as long as inner bracts; inner bracts 12–18, of equal length, linear-lanceolate, acute, with narrow scarious border, glabrous on inner side, not thickened on the outside at fruiting. Receptacle foveolate, glabrous. Florets yellow, one and one-half to two times as long as involucre. Corolla 14–18 mm long; ligule up to 2.5 mm wide; corolla tube 3–5 mm long, weakly pubescent with short acicular hairs. Style branches dark or yellowish-green. Achenes all alike, reddish-brown, 3.5–4.0 mm long and 0.5–0.7 mm wide, cylindrical, somewhat strongly narrowed toward the base, straight or slightly curved, with 20 slender, rounded smooth ribs; pappus 5 mm long, white, persistent. Chromosomes $2n = 12$. Flowering June to July.

Forest meadows, edges and glades, sparse coniferous, mixed, birch and birch-aspen forests, occasionally in subalpine meadows.—*Western Siberia*: Ob' Region (southeastern part), Irtysh (northeastern part), Altai; *Eastern Siberia*: Angara-Sayans, Dauria (southeastern part). *General distribution*: Possibly found in the northeastern part of Mongolia. Described from Siberia. Type in London.

12. *C. mollis* (Jacq.) Aschers, Fl. Brand. (1864) 386; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 280 (The Genus *Crepis* 2); Stank. and Tal. Opređ. Vyssh. Rast. ed. 1, 699; Mikhailovskaya, Fl. Poleskoi Nizmennosti 411; Szaf. Kulcz. Pawl. Rosl. Poiskie (1853) 747.—*C. hieracioides* Waldst. and Kit. Descr. et icon. pl. rar. Hung. I (1802) 71; DC. Prodr. VII, 1, 170.—*C. succisaefolia* (All.) Tausch in Flora XI, 1 (1828) 79; Ldb. Fl. Ross. II, 829; Schmalh. Fl. II, 154, excl. pl. cauc.; Fedtsch. and Fler. Fl. Evrop. Ross. 1061; Klovov in Vizn. Rosl. URSR, 595.—*Hieracium molle* Jacq. Fl. Austr. II (1774) 12.—*H. succisaefolium* 625 All. Fl. Pedem. I (1785) 215.—*Geracium siccisaefolium* (All.) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1368.—*G. molle* (Jacq.) Schur. Enum. pl. Transsilv. (1866) 377.—*Omalocline succisaefolia* (All.) Monn. Ess. monogr. Hierac. (1829) 78.—*Hapalostephium hieracioides* (Waldst. and Kit.) Sweet, Hort. Brit. ed. 3 (1839) 413.—*Aracium succisaefolium* (All.) D. Dietr. Synops. pl. IV (1847) 1330.—*Soyeria hieracioides* (Waldst. and Kit.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 321.—*Succisocrepis succisaefolia* (All.) Forr. in Ann. Soc. Linn. Lyon. nouv. ser. XVII (1869) 104.—*Hieracioides molle* (Jacq.) O. Ktze. Rev. gen. I (1891) 345. "*Hieracioides*".—*lc.*: Jacq. op. cit. t. 119; Waldst. and Kit. op. cit. t. 70; Bab. op. cit. fig. 36.—*Exs.*: Fl. austro-hung. No. 3405; Callier, Fl. siles. exs. No. 218; Petrak, Fl. Bohem. et Morav. exs. Lgf. VI, No. 575; Rehman and Woloszczak, Fl. Polon. exs. No. 200.

Perennial. Rhizome short, slender, obtuse, with numerous roots. Stem solitary, 40–75(90) cm high, erect, straight, ribbed-sulcate, hollow, branched at the apex, less often from middle, sparsely leafy, green, pubescent in the lower part or toward the base with long sparse eglandular, flexuous, slightly entangled whitish hairs or glabrous but below capitula always scarcely woolly-hairy, as also involucre bracts covered with short, thin, glandular, greenish, less often black hairs. Leaves thin, pubescent on both surfaces, with scattered, rather long, eglandular, flexuous whitish hairs; upper cauline leaves usually glabrous; basal and lower cauline leaves 8–20 cm long (including petiole) and 1.5–3.0 cm wide, oblanceolate or oblong-oblanceolate, obtuse or subacute, entire or with remote small teeth, more or less gradually narrowed into long petioles; middle and upper cauline leaves smaller, oblong or oblong-lanceolate, subobtuse to acute, entire or with remote small teeth, sessile, semiamplexicaul; apical leaves bracteiform. Capitula in corymbose inflorescence, on straight or slightly curved peduncles. Involucre narrow campanulate, 9–11 mm long and 5–6 mm wide (at flowering time); outer involucre bracts 7–10, of unequal length, deltoid- or oblong-oblanceolate, acute, white hairy along the upper margin, without scarious border, one-fourth to one-third as long as inner bracts; inner bracts 12–14, of equal length, linear-lanceolate, acute or acuminate, white hairy along upper margin, with narrow scarious border, glabrous on the inner surface, not thickened at sides at fruiting. Receptacle with five-angled areole, glabrous. Florets yellow, one and one-half to two times as long as involucre. Corolla 11–13 mm long; corolla tube 3–4 mm long; more or less densely pubescent in the upper part with rather long, flexuous, thin hairs. Style branches dark green or greenish-yellowish. Achenes similar reddish-brown, 3–4 mm long and 0.5–0.7 mm wide, cylindrical, very slightly narrowed at both ends, slightly curved or straight, with 20 thin, rounded, smooth ribs; pappus 5–6 mm long, white, readily shedding. Chromosomes $2n = 12$. Flowering June to July.

626 Wet meadows.—*European Part*: Baltic Region, Upper Dnieper, Middle Dnieper (northwestern part). *General distribution*: Atlantic and central Europe, Balkans (northern part). Described from Europe. Type in Vienna.

Note. It differs from the similar species *C. lyrata* (L.) Froel. by entire or remote small-toothed leaves, larger involucre, the receptacle with five-angled areolae (and not being foveolate), smaller florets, a corolla tube that is pubescent above with rather dense and long hairs, the color of the achenes, a readily shedding pappus, and a different range.

13. *C. willemetioides* Boiss. Fl. or. III (1875) 845; Bab. in Univ.

Calif. Publ. Bot. 22 (1947) 284 (The Genus *Crepis*, 2); Nikitin in Fl. Turkm. VII, 347.—*Hieracioides willemetioides* (Boiss.) O. Ktze. Rev. gen. I (1891) 346, "*Hieracioides*".—**lc.**: Babc. op. cit. fig. 37.

Perennial. Rhizome short, slender, obtuse, with cordlike roots. Stems one or two, 25–70 cm high, erect, straight, weakly ribbed-sulcate, hollow, branched in the upper part or from the middle, sparsely leafy, green, pubescent up to capitula with scattered, slightly flexuous, eglandular whitish hairs, usually mixed with fewer short glandular hairs, scarcely woolly-hairy in inflorescence and with occasional or more or less dense (below capitula), short, thin, reddish-brown or greenish stalked glands. Leaves thin, glabrous above, scatteredly short pubescent beneath with glandular dull hairs often mixed with few longer eglandular hairs; basal and lower cauline leaves oblong-ob lanceolate, obtuse or subacute, lyrate-lyrately pinnatisect, with large, ovate or elliptical, cordate, obtuse or subacute, irregularly toothed terminal segment and semi-elliptical, oblong, less often irregular, angular, more or less obtuse, indistinctly toothed lateral segments, reducing toward the base, narrowed into long petiole; middle and upper cauline leaves oblong-lanceolate, subacute, or acute, irregularly sinuate-small toothed, sometimes with one or two pairs of deltoid lobes at the base, sessile, cordate, amplexicaul; apical leaves strongly reduced, bracteiform. Capitula in corymbose inflorescence, on straight or slightly curved peduncles. Involucre narrow-campanulate, 9–10 mm long and 5–6 mm wide (at flowering time), involucre bracts covered on the outside with mixture of short and long glandular hairs; outer involucre bracts 10–11, of unequal length, linear-lanceolate, acute, without scarious border, half as long as inner; inner bracts 15–18, of equal length, linear-lanceolate, acute or acuminate, white hairy along upper margin, with narrow scarious border, glabrous on inner side, not thickened dorsally outside at fruiting. Receptacle with ciliate fimbria. Florets yellow, one and one-half to two times as long as involucre, 12–13 mm long; corolla tube 3.0–3.5 mm long, more or less densely pubescent above with somewhat long thin hairs. Style branches dark green. Achenes all alike, dark-reddish-brown, 4 mm long, cylindrical, somewhat strongly narrowed toward apex, slightly curved, with 15 thin, rounded, smooth or thin- and finely rugose (under a hand lens!) ribs; pappus 5–7 mm long, white, readily shedding. Chromosomes $2n = 12$. Flowering (May) June to July.

Mountain steppe zone, among thicccets of woody-scrubby vegetation.—*Soviet Central Asia*: mountainous Turkmenia (Khosar-Dag Range in Kara-Kal District). *General distribution*: Iran (Siaret). Described from northeastern Iran. Type in Geneva; duplicates of type in Leningrad.

Section 4. Soyeria (Monn.) Benth. in Benth. and Hook. f. Gen. pl.

II (1873) 515, p. p.; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 210 (The Genus *Crepis*, 2).—*Catonia* Moench, Meth. (1794) 535, p. p. non P. Br. (1756).—*Lepicaune* Lapeyr. Hist. Abr. Pl. Pyr. (1813) 478, p. p.—*Hapalostephium* D. Don in Edinb. New Phil. Journ. (1829) 307, p. p.—*Soyeria* Monn. Ess. monogr. Hierac. (1829) 75, p. p.—*Crepis* d. *Catonia* Rchb. Fl. germ. excurs. I (1830) 258, p. p. descr. in Moessl. Handb. ed. 2, II, 2 (1829) 1402, p. p. nomen.—*Crepis* sect. *Hapalostephium* (D. Don) Froel. in DC. Prodr. VIII, 1 (1838) 165, p. p.—*Crepis* sect. *Hieracioides* Froel. in DC. ibid. (1838) 167, p. min. p.—*Crepis* sect. *Crepis* §3. Koch, Synops. ed. 2, 2 (1844) 506, p. p.—*Crepis* sect. *Daucocrepis* Sch. Bip. ex Bisch. Beitr. Fl. Deutschl. Schweiz. (1851) 248, 294, p. p.—*Crepis* sect. *Succisocrepis* Sch. Bip. ex Bisch. ibid. (1851) 248, 308, p. min. p.—*Berinia* subgen. *Melanoberinia* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1886) 316, p. min. p.—*Omalocline* D. *Daucomalocline* Sch. Bip. ibid. (1866) 321.—*Soyeria* B. *Chlororacium* Sch. Bip. ibid. (1866) 322.—*Crepis* sect. *Catonia* O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. p.—Perennial, more or less pubescent plants. Roots virgate, woody, vertical. Caudex leafy usually one-stemmed. Stem rather hard, 20–50(70) cm high, branched mostly above or from the middle. Basal and lower cauline leaves oblanceolate, oblong-oblanceolate or oblong-obovate, runcinately toothed, petiolate; middle cauline leaves oblong or oblong-lanceolate, gradually reduced [upward], sessile, apical leaves very small, linear. Capitula rather large, with many florets, aggregated in simple corymbs. Outer involucre bracts two-thirds to half (one-third) and less as long as inner bracts; inner bracts weakly pubescent on the inside, less often glabrous, slightly hardened at the base at fruiting. Receptacle foveolate, ciliolate. Corolla 18–23 mm long with 5–7 mm long tube, weakly pubescent with short aciclar hairs. Achenes all alike, yellowish-reddish brown, 5–9 mm long, fusiform, almost similarly narrowed at both ends or slightly strongly above, without beak, with 17–20 longitudinal ribs; pappus pale yellowish or white, 5–10 mm long.

628 Type (lectotype) of section: *C. pontana* (L.) Dalla Torre.

14. *C. pontica* C.A.M. in Mém. Acad. Sc. Pétersb. ser. VI, Sc. Nat. VII (1855) 14; Grossh. Fl. Kavk. 264 and Opred. Rast. Kavk. 519, excl. syn.; Kolak. Fl. Abkhazii, IV, 308; Papava in Fl. Gruzii, VIII, 706, excl. syn.—*C. grandiflora* auct. non Willd.: Ldb. Fl. Ross. II, 2 (1846) 827.—*C. djimilensis* (C. Koch) Boiss. Fl. or. III (1875) 833, p. p.; Grossh. op. cit. (1934) 264, p. p.—*C. conyzifolia* auct. p. min. p. non Dalla Torre: Bab. in Univ. Calif. Publ. Bot. 22 (1947) 297 (The Genus *Crepis*, 2).

Perennial. Root woody, vertical. Caudex 1–2 cm long, mostly simple,

covered with dark brown remnants of petioles of dead leaves. Stem one (less often two), 20–50(70) cm high, somewhat thick, arcuately ascending at the base, erect above, ribbed-sulcate, hollow, branched mostly above or from the middle, with upward spreading, simple branches, leafy, slightly arachnoid pubescent all over; lower part covered with long, yellowish somewhat flexuous, eglandular hairs; upper part covered with sparse, very short reddish-brown glandular hairs mixed with fewer or isolated, yellowish or blackish (in the upper part of peduncle), erect, eglandular, setaceous, long hairs; basal and lowermost cauline leaves 5.5–20.0 cm long (including petiole) and 2–4 cm wide, oblong-ob lanceolate or oblong-obovate, obtuse to subacute, runcinately toothed with narrowly triangular unequal teeth, sometimes terminating into long bristle, narrowed into narrowly winged petiole, one-third to half as long as lamina; middle cauline leaves oblong or oblong-lanceolate, subobtuse to acute, sinuate-toothed or with remote small teeth, sessile, mostly rounded at the base, indistinctly amplexicaul, apical leaves strongly reduced, linear, entire; all leaves green, glabrous, with upright long, yellowish, eglandular, setaceous hairs only along midrib (mostly beneath), hairs sometimes scattered on both surfaces, less often some leaves short-glandular hairy, without cilia along margin, or upper cauline leaves ciliate. Capitula in simple corymbs, on somewhat thick peduncles almost not thickened below capitula. Involucre broadly campanulate, (12)14–17 mm long, involucre bracts covered with mixture of stiff, long, blackish or greenish, eglandular hairs and very short reddish-brown or dark green glandular hairs on outer side; outer involucre bracts of unequal length, linear-lanceolate, subacute or acute, without scarious border, glabrous on inner surface, one-third to half (two-thirds) as long as inner bracts; inner bracts of equal length, oblong-lanceolate, subacute, with narrow, white-scarious border (innermost), white, hairy along upper margin, 629 sparsely pubescent on inner side in the upper part with inconspicuous rather coarse, appressed white hairs, less often glabrous, slightly hardened at the base at fruiting. Receptacle foveolate, walls of pits membranous, ciliolate above. Florets yellow, one and one-half to two times as long as involucre. Corolla 18–23 mm long; ligule to 3 mm wide; corolla tube 5–7 mm long, sparsely pubescent with short, acicular, hyaline, somewhat coarse hairs. Style branches yellow. Achenes all alike yellowish-reddish-brown, 6.5–8.0 mm long and about 1 mm wide, fusiform, almost uniformly narrowed at both ends or slightly strongly above, somewhat curved, with 17 narrow, rounded, smooth ribs, not reaching the achene apex; pappus 8–10 mm long, pale yellowish; pappus hairs thin, persistent. Flowering July to August (September). (Plate XXII, Fig. 2).

Meadows, subalpine and alpine mountain zones.—*Caucasus*: Western

Transcaucasia (Abkhazia—Gagrin Range, Ashkhabashkha pasture and Bombei-Yashta—Guria, Adzharia). Endemic. Described from Western Transcaucasia (Guria). Type and its duplicates in Leningrad.

Note. In Lazistan, it is replaced by a very similar race of *C. djimilensis* (C. Koch) Boiss. s. str., that by its characters occupies an intermediate position between *C. conyzifolia* (Gouan) Dalle Torre and *C. pontica* C.A.M.

15. **C. conyzifolia** (Gouan) Dalle Torea, Atl. Alpen-fl. (1884) 145; Hegi, Ill.-Fl. IV, 2, 1149; Babç. in Univ. Calif. Publ. Bot. 22 (1947) 297, p. p (The Genus *Crepis*, 2); Klokov in Vozn. Rosl. URSR, 595; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 747; Dostal, Klič (1958) 636.—*C. grandiflora* (All.) Willd. Enum. pl. hort. Berol. Supl. (1813) 56; Tausch in Flora XI, 1 (1828) 80; Florel. in DC. Prodr. VII, 1, 166.—*Hieracium conyzifolium* Gouan, Ill. et Observ. Bot. (1773) 59.—*H. conyzioideum* Lam. Fl. Fr. II (1778) 197.—*H. grandiflorum* All. Fl. Pedem. I (1785) 217.—*H. intybaceum* Lam. Encycl. meth. II (1786) 369.—*H. pappoleucum* Vill. Hist. Pl. Dauph. III (1789) 134.—*Lepicaune intybacea* (Lam.) Lapeyr and *L. grandiflora* (All.) Lapeyr. Hist. Abr. Pl. Pyr. (1813) 479.—*Soyeria grandiflora* (All.) Monn. Ess. monogr. Hierac. (1829) 76.—*Berinia grandiflora* (All.) Sch. Bip. in Jahresbericht Pollichia XXII—XXIV (1866) 317, p. p.—*Brachyderea grandiflora* (All.) Sch. Bip. ibid. (1866) pro syn.—*Hieracioides conyzifolium* (Gouan) O. Ktze. Rev. gen. I (1891) 345, "*Hieraciodes*".—**lc.**: Javorka and Csapody, Iconogr. Fl. Hung. 565, fig. 4057; Babç. op. cit. fig. 43; Dostal, op. cit. t. 221, fig. 2166.—**Exs.**: Sch. Bip. Cichoriaceotheca, Suppl. No. 120; Schultz. Herb. norm. cent. 9, No 893; Billot. Fl. Gall. et Germ. exs. No. 3431; Fl. exs. austro-hung. No. 3403; Hayek, Fl. stir. exs. No. 1281; Fiori and Béguinot, Fl. Ital. exs. ser. II, No. 1798.

Perennial. Very similar to *C. pontica* C.A.M. but differing from it by the coarse stem that is devoid of arachnoid-hairy pubescence, peduncles distinctly thickened below the capitula, very short, usually wide-winged petioles of the basal and lower cauline leaves, and particularly distinctly amplexicaul, sagittate, auriculate cauline leaves. Chromosomes $2n = 8$. Flowering July to August.

Subalpine meadows.—*European part*: Upper Dniester (Carpathians). *General distribution*: southern and central Europe. Described from Europe. Type unknown.

Section 5. Crepis.—*Berinia* Bringnol. Fasc. rar. pl. Forojul. (1810) 50.—*Brachyderea* Cass. in Dict. Sc. nat. XLVIII (1827) 429.—*Crepis* b. *Crepis* Rchb. Fl. germ. excurs. I (1830) 257, p. min. p. descr. and in Moessl. Handb. ed. 2, II, 2 (1829) 1397, p. min. p. nomen.—*Crepis* c.

Brachyderea (Cass.) Rchb. op. cit. (1829) 1402.—*Limnoseris* Peterm. Fl. Lips. excurs. (1838) 589.—*Crepis* sect. *Brachyderea* (Cass.) DC. Prodr. VII, (1838) 160; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 514.—*Crepis* sect. *Eucrepis* DC. op. cit. (1838) 161, p. min. p.; O. Hoffm. in Pflanzenfam. VI, 5 (1894) 374, p. min. p.—*Crepis* sect. *Intybellioides* Froel. in DC. op. cit. (1838) 167, p. min. p.—*Crepis* sect. *Crepis* §1. Koch, Synops. ed. 2, 2 (1844) 502, p. min. p.—*Crepis* sect. *Alethocrepis* Bisch. Beitr. Fl. Deutschl. Schweiz. (1851) 247, 266, p. min. p.—*Crepis* sect. *Daucocrepis* Sch. Bip. ex Bisch. ibid. (1851) 248, 294, p. min. p.—*Berinia* subgen. *Leucoberinia* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 315, p. p.—*Berinia* subgen. *Melanoberinia* Sch. Bip. ibid. (1866) 316, p. min. p.—*Berinia* subgen. *Dietoberinia* Sch. Bip. ibid. (1866) 319, p. p.—*Crepis* sect. *Omalocline* (Cass.) Benth. op. cit. (1873) 515, p. min. p.—*Crepis* sect. *Eucrepis* §2 Fusiformes Boiss. Fl. or. III (1875) 831, p. p.—*Crepis* sect. *Eucrepis* §5. Malacophyllae Boiss. ibid. (1875) 832, p. min. p.—*Crepis* subgen. *Crepis* Schmalh. II (1897) 152, p. p.—*Crepis* sect. *Berinia* (Brignol.) Babc. in Univ. Calif. Publ. Bot. 22 (1947) 211 (The Genus *Crepis*, 2).—*Senecio* sect. *Pseudopicris* Prokh. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 432, in adnot.—Perennial, less often biennial, more or less pubescent. Root virgate, woody, mostly vertical. Caudex woody, short, simple or short and sparsely branched, leafy. Stem solitary or few, erect, usually stiff, (7)15–120 cm high, branched, leafy. Basal and lower cauline leaves oblong-obovate to oblanceolate, with small teeth, and large pinnatipartite, less often pinnatisect, petiolate; middle and upper cauline leaves ovate to lanceolate and linear, sessile, apical leaves strongly reduced, narrowly lanceolate or linear, often bracteal. Capitula medium, with many florets, aggregated in corymbose, paniculate or racemose inflorescence. Outer involucre bracts two-thirds to one-third (one-fourth) as long as inner bracts; inner bracts glabrous or
632 pubescent on the inside, keeled outside at fruiting, hardened at the base. Receptacle foveolate, ciliate or ciliolate. Corolla 12–20 mm long, with (2)3–8(9) mm long tube, weakly pubescent with short acicular hairs. Achenes all alike, dark reddish-brown, dark reddish-brown, brownish-yellowish or stramineous, 4–10 mm long, fusiform, somewhat strongly narrowed toward the apex, without beak, with (11)13–20(22) longitudinal ribs; pappus white or whitish, 5–10 mm long.

Type of section: type of genus.

Subsection 1. Corymbiformae (Babc.) Czer. comb. nova.—Sect. *Berinia* subsect. *Corymbiformae* Babc. in Univ. Calif. Publ. Bot. 22 (1947) 212 (The Genus *Crepis*, 2).—Plants (15)30–120 cm high. Basal and lower cauline leaves rather wide, to 7(10) cm, oblong-obovate to



oblanceolate; cauline leaves usually numerous, gradually reduced toward the stem apex, ovate to oblong-lanceolate and lanceolate; stem hard, branched. Inflorescence corymbose, corymbose-paniculate or racemose. Capitula medium, with many florets. Involucral bracts grayish arachnoid-hairy or grayish tomentose on the outside, setaceous hairy or with short glandular hairs or thin eglandular spinules.

Type of subsection: *C. pannonica* (Jacq.) C. Koch.

16. ***C. darvazica*** Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 1 (1933) 182; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 426 (The Genus *Crepis*, 2); Kovalevskaya in Fl. Uzb. VI, 494.—*C. rigida* γ. *songorica* Kar. and Kir. in Bull. Soc. Nat. Mosc. XV (1842) 399 (Enum. pl. Songor. No. 524); Ldb. Fl. Ross. II, 2, 821; Trautv. in Bull. Soc. Nat. Mosc. XXXIX, 2 (1866) 387; Rgl. in Bull. Soc. Nat. Mosc. XL, 3 (1867) 177; O. and B. Fedtsch. Perech. Rast. Turk. IV, 344.—*C. abolini* M. Pop. in Byull. Mosc. Obshch. Ispyt. Prirody, Nov. Ser. XLII, 2 (1933) 128, nomen; Fl. Almat. Zapovedn. 50, nomen.—*C. songorica* (Kar. and Kir.) Bab. op. cit. (1947) 426.—**Ic.**: Bab. op. cit. fig. 101, 102.—**Exs.**: Kar. and Kir. Pl. Songor. No. 1688.

Perennial. Root woody, vertical. Caudex short, simple or with few short branches, covered with dark brown remnants of petioles of dead leaves. Stem solitary, less often two to four, (15)20–60(65) cm high, straight or strongly flexuous, ribbed-sulcate, sparsely dichotomously branched above or from the middle, less often almost from the base, with upward spreading, more or less long, thin branches, leafy, relatively weakly woolly in the lower half, moreover, covered with rather dense or sparse, somewhat long, basally broadened, pale or lilac, eglandular or glandular (often mixture of both), curved stiff hairs, slightly woolly-hairy above, less often subglabrous, usually smooth. Basal and lower cauline leaves to 22(26) cm long (including petiole) and to 5 cm wide, 633 oblong-oblanceolate or oblanceolate subobtusate to acute, with small teeth or irregularly sinuate-toothed, with acute or subacute, deflexed teeth, narrowed into winged petiole broadened at the base; middle and upper cauline leaves ovate to oblong-lanceolate, acute or acuminate, mostly with small teeth or partly subentire, sessile, amplexicaul; apical leaves strongly reduced, bracteiform; all leaves thick, spinulose along margin, subglabrous above, with scattered or rather dense (only on midrib), more or less long, slightly curved stiff hairs beneath, mixed with very sparse, lax, woolly pubescence, sometimes (mostly basal and lower cauline leaves) also with fewer short glandular hairs, less often subglabrous. Capitula in lax corymbose inflorescence, on straight or slightly curved, slender peduncle, often covered with grayish tomentum and fewer glandular hairs below capitula. Involucre campanulate, 11–15 mm long

and (5)6–9(10) mm wide (at the beginning of flowering); involucre bracts with grayish glandular pale or reddish-brown hairs on the outside, white hairy along the upper margin, glabrous on the inside; outer involucre bracts 8–10, of unequal length, oblong-ovate to oblong-lanceolate, acute or subobtuse, without scarious border, blackish in the upper part, (two-thirds) half to one-third (one-fourth) as long as inner bracts; inner 12–14, of equal length, oblong-lanceolate, obtuse, with narrow white scarious border (innermost), mostly dark green or blackish in middle part, keeled on the outside at fruiting, slightly thickened and hardened at the base. Receptacle foveolate, walls of pits membranous, erose-denticulate above. Florets yellow, one and one-half to two times as long as involucre. Corolla 15–20 mm long; ligules to 2.5(3.0) mm wide; corolla tube 6–8(9) mm long, pubescent with sparse, very short, coarse, hyaline hairs, sometimes with longer hairs above. Style branches yellow. Achenes all alike, dark reddish-brown (immature achenes yellowish-orange), (6)7–10 mm long and 0.8–1.2 mm wide, fusiform, somewhat strongly narrowed above, straight, or slightly curved, with 16–18(22) narrow, rounded, somewhat thicker ribs, not reaching achene apex and covered with very small (visible under high magnification!), erect spiny hairs; pappus 8–10 mm long, white. Flowering June to July.

Stony and rubbly slopes, among shrubs, rocky exposures, middle mountains zone up to 2,600 m.—*Soviet Central Asia*: Dzhungaria-Tarbagatai (Dzhungarian Alatau Range), Tien Shan, Pamiro-Alai. *General distribution*: Dzhungaria-Kashgaria (Dzhungaria, Khanakhai). Described from Darvaz (Khobu). Type and its duplicate in Leningrad.

Note. I.M. Krascheninnikov (op. cit.) included *C. darvazica* Karasch. under *C. pannonica* (Jacq.) Koch, while Babcock (op. cit.) considers it
 634 much closer to *C. strausii* Bornm., *C. sonchifolia* (M.B.) C.A.M. and *C. songorica* (Kar. and Kir.) Babc. I include the last species as a synonym of *C. darvazica* Krasch., because a careful study of all the herbarium material, including also the authentic specimen of *C. darvazica* Krasch., showed that its differences (higher growth, larger corolla, long corolla tube, different color of achenes and larger number of the ribs on achenes) from *C. songorica* (Kar. and Kir.) Babc. do not strictly persist in the plants from the Pamirs.

17. ***C. sonchifolia*** (M.B.) C.A.M. in Fisch. and Mey. Enum. pl. nov. II (1842) 32; Boiss. Fl. or. III, 834; Lipsky, Fl. Kavk. 373; Grossh. Fl. Kavk. IV (1934) 264 and Opred. Rast. Kavk. 519; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 429, p. p. (The Genus *Crepis*, 2); Papava in Fl. Gruzii, VIII, 706; Asker. in Fl. Azerb. VIII, 569.—*C. incana* auct. non Sibth. and Smith: Ldb. Fl. Ross. II, 2 (1846) 827.—*C. dens-leonis* C. Koch in Linnaea XXIII (1850) 689; Babc. op. cit. 474.—*C. macropus* β. *phrygia* Boiss. Fl. or. III (1875) 837, p. p.—*C. phrygia* (Boiss.) Lipsky,

Fl. Kavk. (1899) 373; Grossh. Fl. Kavk. IV (1934) 264 and Opred. Rast. Kavk. 519.—*C. kurdistanica* Asker. in Dokl. Akad. Nauk Azerb. SSR, XIV, 11 (1958) 901 and in Fl. Azerb. VIII, 570.—*Hieracium sonchifolium* M.B. Fl. taur-cauc. II (1808) 252; Ldb. op. cit. 851.—*lc.*: Babc. op. cit. fig. 103, 122 and pl. 8 (photo isotypi *C. densleonis* C. Koch).

Perennial. Root long, woody, vertical. Caudex short, simple or branched with few short branches, covered with few dark brown remnants of petioles of dead leaves. Stem one to several, 25–60(70) cm high, stiff, straight, often somewhat flexuous, ribbed-sulcate, dichotomously branched from middle or almost from the base, with upward spreading, long and thin branches, leafy, slightly scabrous along angles due to sparse fine tubercles or spinules, less often smooth, sparingly arachnoid below, sometimes subtomentose, in the upper part scatteredly woolly-hairy or glabrous. Basal and lower cauline leaves to 16(18) cm long (including petiole) and to 5 cm wide, oblong-ob lanceolate or oblanceolate, subobtuse to acute, lyrate divided or deeply lyrate pinnatifid, less often lyrate lobed with large ovate-deltoid or oblong-deltoid, irregularly sinuate-toothed terminal segment and considerably smaller, mostly remote, ovate deltoid, deltoid or lanceolate, acute, with irregular acute teeth or shallow lobes, unequal lateral lobes reducing toward the leaf base, or with segments, narrowed into short petiole broadened toward the base; middle cauline leaves oblong-lanceolate, acute, sinuate-toothed to deeply pinnatifid, sessile, usually semiamplexicaul; apical leaves strongly reduced, bracteal; all leaves
635 somewhat thin but compact, with prominent veins along margin (mostly beneath along midrib), bearing occasional fine tubercles or spinules, mostly weakly arachnoid hairy to subglabrous on both surfaces. Capitula in lax, mostly irregularly compound corymbose inflorescence, on straight or arcuate, long and thin peduncles. Involucre campanulate, 11–13(15) mm long and 6–7 mm wide (at the beginning of flowering); involucre bracts more or less grayish-tomentose, with one or two rows of rather numerous or sparse, fine, black, rarely white, somewhat thick spinules or tubercles along the median line, very rarely inner bracts without spinules, glabrous on the inside; outer involucre bracts 8–10, of unequal length, linear-subulate, acute, without scarious border, blackish, half to one-third as long as inner bracts; inner bracts 12–13, of equal length, linear-lanceolate, subacute, with narrow white scarious border (innermost), white hairy along the upper margin, in the middle with narrow, black, longitudinal stripe, keeled outside at fruiting, thickened and hardened at the base. Receptacle foveolate, walls of pits membranous, ciliate above. Florets yellow, one and one-half to two times as long as involucre. Corolla 13–20 mm long; ligules up to 2.5(3.5) mm wide; corolla tube 4–5 mm long, pubescent with fewer, short, acicular, coarse

hyaline hairs. Style branches yellow. Achenes all alike, dark reddish-reddish-brown, 5–7 mm long and 0.8–1.0 mm wide, mostly slightly curved, with 18–20, almost similar, narrow-rounded ribs, reaching the achene apex and bearing very fine (visible under high magnification!) erect spiny hairs; pappus 6–8(9) mm long, white. Flowering June to July.

Dry stony slopes and escarpments, mountain meadows, middle and upper mountain zones.—*Caucasus*: Ciscaucasia (central Caucasus, in west up to Teberda), Dagestan, Eastern Transcaucasia (northern part), Southern Transcaucasia (northeastern part). Endemic. Described from Eastern Caucasus. Type in Leningrad.

Note. This species grows in the Central and Eastern Caucasus and in the northeastern part of southern Transcaucasia, whereas Babcock (1. c.), with very little material of *C. sonchifolia* (M.B.) C.A.M. at his disposal, restricted its distribution to a small territory of Dagestan.

C. dens-leonis C. Koch, described from the Central Caucasus, from Khevi, was treated by Boissier (op. cit.) as a synonym of *C. sonchifolia* (M.B.) C.A.M., with which I agree entirely. In his monograph of the genus *Crepis* L., Babcock retains *C. dens-leonis* C. Koch as a separate species and even places it in a different subsection. Koch's species is represented by authentic specimens, which are not available in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad. My interpretation of the identity of both of the above-mentioned species is based on the study of the original description of C. Koch, the illustration of the type specimen and photograph of the isotype of *C. dens-leonis* C. Koch published in Babcock's work.

636 R.K. Askerova described a small nonhereditary form of *C. sonchifolia* (M.B.) C.A.M. under the name *C. kurdistanica* Asker.

18. ***C. ciliata*** C. Koch in Linnaea XVII (1845) 277; Boiss. Fl. or. III, 834; Lipsky, Fl. Kavk. 373; Grossh. Fl. Kavk. IV (1934) 262 and Oprod. Rast. Kavk. 518; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 432 (The Genus *Crepis* 2); Papava in Fl. Gruzii, VIII, 701.—*C. zedelmeyerae* Sosn. ex Papava, ibid. (1952) 701, descr. georgica.—*Lepicaune ciliata* (C. Koch) C. Koch in Linnaea XXIII (1850) 683.—*Berinia ciliata* (C. Koch) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 317.—*Hieracioides ciliatum* (C. Koch) O. Ktze. Rev. gen. I (1891) 345, "*Hieraciodes*".—**lc.**: Babc. op. cit. fig. 104; Papava, op. cit. Fig. 441.

Biennial. Root woody, vertical. Stem one, 50–100 cm high, thick, straight, strongly sulcate, branched in the upper part or from the middle with upward-spreading, branched, long branches, covered at root collar with dark- or blackish-brown remnants of petiole of dead leaves, leafy, with scattered or more or less dense (particularly in the lower part),

somewhat long, whitish, eglandular, spreading, stiff bristles, above mixed with sparse woolly-arachnoid-hairy pubescence, pale or in the lower part, less often almost entirely, reddish-violet. Basal and lower cauline leaves oblong-oblancoolate to sublinear, acute or subacute, sinuate-toothed, lyrate lobed or lyrate pinnatipartite, narrowed into narrow-winged petiole; middle and upper cauline leaves oblong-lanceolate, acuminate, sinuate-toothed, often deeply pinnatilobate or pinnatipartite, with unequal, more or less approximate, acuminate or cuspidate, mostly narrowed lobes or segments, sessile, amplexicaul, acuminate, auriculate at the base; apical leaves strongly reduced, linear-lanceolate, usually entire; all leaves compact, covered with somewhat long, eglandular bristles along margin and beneath along midrib, sometimes (mostly basal and lower cauline) scatteredly stiff setose on both surfaces. Capitula in corymbose or corymbose-paniculate inflorescence, on erect or slightly curved peduncles. Involucre campanulate, (10)12–13 mm long and 8–10 mm wide (at beginning of flowering); involucre bracts grayish-arachnoid to grayish-tomentose on the outside, covered with dense or sparse, long, eglandular, yellowish bristles; outer involucre bracts seven to nine, of unequal length, linear-lanceolate, acute, without scarious border, mostly dark green, glabrous on inner surface, two-thirds to half as long as inner bracts; inner bracts 13, of equal length, wide, oblong-lanceolate, subacute with white scarious border (innermost), white hairy along the upper margin, in the middle dark- or blackish-green, strongly pubescent on the inside with appressed white hairs, keeled outside on fruiting slightly thickened and hardened at the base. Receptacle foveolate, walls of pits membranous, ciliolate above. Florets yellow, two times as long as involucre. Corolla 12–16 mm long; ligules to 2 mm wide; corolla tube 4–5 mm long, sparsely pubescent with short, mostly acicular, hyaline hairs. Style branches yellow. Achenes all alike, pale reddish-brown, 4.5–6.0 mm long and 0.8–1.0 mm wide, fusiform, slightly strongly narrowed toward the apex, slightly curved or straight with 18–20 almost similar (sometimes three to five thicker), narrow rounded ribs reaching the achene apex and covered with very fine (visible under high magnification!), erect spiny hairs, or ribs smooth; pappus 6.5–8.0 mm long, white. Chromosomes $2n = 40, 42(?)$. Flowering June to July.

Subalpine meadows and dry slopes; middle and upper mountain zones.—*Caucasus*: Eastern Transcaucasia (Bakuriani District), Western Transcaucasia (Verkhnyaya Racha, the village of Shovi), Southern Transcaucasia (in south up to Daralgez). Endemic. Described from northern Armenia (village of Darachichag). Type in Berlin; duplicates of the type specimen in Leningrad.

Note. The village of Darachichag, from where this species is described, lies in northern Armenia near the northwestern end of Lake

Sevan and not in Iran, as noted with a question mark by Babcock (op. cit.) in his monograph of the genus *Crepis* L.

I could not detect any differences between *C. ciliata* C. Koch and *C. zedelmeyerae* Sosn. ex Papava, an authentic specimen of which was kindly sent to me for examination by A.L. Charadze from Georgia. Moreover, the latter species has been described, to the best of my knowledge, only in Georgian; hence, vide Article 34 of the Paris Code, the name *C. zedelmeyerae* Sosn. ex Papava is not actually valid.

19. *C. biennis* L. Sp. pl. (1753) 807; DC. Prodr. VII, 1, 163, p. p.; Ldb. Fl. Ross. II, 2, 823; Boiss. Fl. or. III, 848; Schmalh. Fl. II, 154; Syreistsch. III. Fl. Mosk. Gub. III, 337; Fedtsch. and Fler. Fl. Evrop. Ross. 1061; O. and B. Fedtsch. Perech. Rast. Turk. IV, 344; Hegi, Ill. Fl. VI, 2, 1162; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 435 (The Genus *Crepis*, 2); Popov, Ocherk. Rast. i Fl. Karpat. 257; Klovov, in Vizn. Rosl. URSR, 595; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 746; Majevski, Fl. ed. 8, 634; Geideman, Opred. Rast. Mold. SSR, 304; Dostal, Klič (1958) 636; Ramenskaya, Opred. Vyssh. Rast. Karelin, 432.—*C. scanensis* L. (It. Scan. (1751) 170) Sp. pl. (1753) 807, pro syn.—*C. muricata* Galib. Fl. Lithuan. III (1781) 231, n. v. and Exerc. phytol. I (1792) 186.—*C. lodomeriensis* Bess. Prim. Fl. Galic. II (1809) 159; DC. op. cit. 163, p. p.—*C. gmelini* Schultes, Osterr. Fl. 2 (1814) 419, excl. Gmel. Fl. sibirica, II, t. XI, non Tausch (1828).—*C. sabauda* Balb. ex DC. op. cit. (1838) 163, pro syn.—*Hedypnois biennis* (L.) Huds. Fl. Angl. ed. 2 (1798) 342.—*Hieracium bienne* (L.) Hornem. Hort. Hafn. (1813) 763; Krasch Fl. Westf. (1856) 126.—*Limnoseris biennis* (L.) Peterm. Fl. Lips. excurs. (1838) 589.—*Hieracioides biennis* (L.) Rupr. Fl. Ingr. I (1860) 627.—*H. tectorum* (L.) O. Ktze. Rev. gen. I (1891) 346, p. p. "*Hieraciodes*".—*Brachyderea biennis* (L.) Sch. Bip. ex F. Schultz in Jahresbericht Pollichia XX–XXI (1863) 173.—*Berinia liennis* (L.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 319.— *Ic.*: Syreistsch. op. cit.; Fedtsch. and Fler. op. cit. Fig. 1074; Bonnier, Fl. Compl. France, Suisse et Belg. VI, t. 358; Hegi, l. c. Fig. 839, a–d, Taf. 278, Fig. 3 (color.); Javorka and Csapody, Iconogr. Fl. Hung. 563, fig. 4043; Babc. l. c. pl. 7 (photo typi), fig. 105; Dostal, l. c. t. 222, fig. 2171.— *Exs.*: GRF No. 772; Herb. Fl. Ingr. No. 360; Fl. exs. austrohung. No. 3410; Billot, Fl. Gall. et Germ. exs. No. 1915; Domin, Pl. Bohem. exs. sine numero; Reliq. Maillean. No. 676; Sch. Bip. Cichoriaceotheca, No. 59; Soc. dauph. 1885, No. 4597 bis; Samuelsson, Pl. Suec. exs. No. 1611.

Biennial. Root short, woody, strongly branched. Stem one, (30)40–120 cm high, more or less slender or thick, erect, ribbed-sulcate, branched above, with upward spreading, simple or sparingly branched above, rather

slender branches, root collar covered with dark brown remnants of petioles of dead leaves, leafy, lilac in the lower half; covered with remote, less often somewhat dense, whitish, eglandular, erect, slightly curved hairs, simple, pale green above, scarcely woolly arachnoid-hairy or subglabrous, sometimes entirely glabrous, smooth, often woolly on ribs of petioles from mostly sparse stiff bristles or spinules. Basal and lower cauline leaves (5)8–30 cm long (including petiole) and 1.5–7.0(9.0) cm wide, oblanceolate or oblong-oblanceolate, obtuse to acute, remotely sinuate-toothed, often rucinate pinnatipartite or pinnatisect with large, mostly deltoid, sinuate-toothed terminal lobe and much smaller, remote, triangular-ovate to linear-lanceolate, acute or acuminate, usually with remote teeth, or one or two lobes along the upper margin, retrorse lateral lobes or segments, narrowed into narrow-winged petiole broadened toward the base; middle cauline leaves lanceolate, acuminate, remotely sinuate-toothed to pinnatisect, sessile, not amplexicaul or very slightly amplexicaul, and then auriculate but not sagittate, apical leaves strongly reduced, linear, entire; all leaves thin, covered on both surfaces with short, remote, whitish, eglandular slightly curved, somewhat stiff, simple hairs, mostly longer and denser, beneath along midrib, apical leaves glabrous or sparsely soft-hairy. Capitula in compound, less often simple, corymbose inflorescence on slightly curved, slender peduncles. Involucres campanulate, 8–13 mm long, and 5–8 mm wide (at beginning of flowering); involucre bracts grayish arachnoid-hairy on the outside, with pale green to blackish hairs in the middle, without scarious border, usually linear, sparsely covered with long, yellowish, almost black, eglandular bristles or shorter, glandular, somewhat thick hairs, both types often mixed; outer involucre bracts seven to nine, more or less of equal length, linear-lanceolate, acute, glabrous on the inside, two-thirds to half as long as the inner bracts, deflexed at fruiting; inner bracts 12–13, of equal length, oblong-linear, subobtuse, white hairy along upper margin, strongly pubescent on inner side with appressed white hairs, keeled outside at fruiting, with slight spongy thickening at the base, and hardened. Receptacle foveolate, walls of pits membranous, ciliate above. Florets yellow, two times as long as involucre. Corolla 12–17 mm long; ligules to 2.3 mm wide; corolla tube 3–5 mm long, sparsely pubescent with short, acicular, hyaline, thin hairs. Style branches yellow, very rarely greenish. Achenes all alike, stramineous or pale reddish-brown, 4–5.5(6.5) mm long and 0.6–0.8 mm wide, fusiform, somewhat strongly narrowed toward the apex, straight or slightly curved, with (11)13–18 narrow, rounded, somewhat thicker ribs reaching the achene apex and bearing very fine (visible under high magnification!), erect, spiny hairs; pappus 5–7 mm long, white. Chromosomes $2n = 40$. Flowering June to August.

Forest meadows, glades and forest edges, among shrubs, sparse forests.—*European Part*: Karelia-Lapland (extreme south), Baltic Region, Ladoga-Ilmen, Upper Volga, Upper Dniester, Bessarabia (northern half of region), Upper Dnieper, Middle Dnieper (rarely), Volga-Don (northwestern part). *General distribution*: Central Europe, Atlantic Europe (south), Balkans (north), North America (introduced). Described from Sweden (Scania [Skåne]) and Southern Europe. Type in London.

Note. A highly polymorphic species of the plains, varying in stem height, size and particularly the division of the leaves, size of the involucre, their pubescence, and many other characters. However, over its extensive range it does not split off into separate geographic and ecological races. The forms reported for the territory of the USSR (var. *platyphylla* Wallr., var. *lacera* Wimm. and Grab., and var. *carpatica* M. Pop.), like most central European forms, have hardly any taxonomic significance.

Reports by earlier authors of *C. biennis* L. growing in many areas (Shutor River in northern Urals, Perm Region, vicinity of Samarkand), not included by me in the distribution of this species, have not been confirmed by later reports. For some other areas (vicinity of Kazan, the area between Mozdok and Kizlyar), it was reported erroneously, based on an incorrect identification.

20. **C. pan-nonica** (Jacq.) C. Koch in Linnaea XXIII (1850) 689; Hegi, Ill. Fl. VI, 2, 1140; Grossh. Fl. Kavk. IV (1934) 263 and Opred. Rast. Kavk. 519; Kraschen. in Fl. Yugo-Vost. VI, 473; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 438, p. p. (The Genus *Crepis*, 2); Kolak. Fl. Abkhazii IV, 308; Klovov in Vozn. Rosl. URSR, 595; Papava in Fl. Gruzii, VIII, 705; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 748; Majewski, Fl. ed. 8, 635; Geideman, Opred. Rast. Mold. SSR, 304; Dostal, Klič 640 (1958) 634; Asker. in Fl. Azerb. VIII, 569.—*C. rigida* Waldst. and Kit. Descr. et icon. pl. rar. Hung. I (1802) 18; M.B. Fl. taur.-cauc. II, 256, III, 537; DC. Prodr. VII, 1, 160; Ldb. Fl. Ross. II, 2, 821, p. p.; Boiss. Fl. or. III, 834, p. p.; Schmalh. Fl. II, 154; Lipsky, Fl. Kavk. 373; Fedtsch. and Fler. Fl. Evrop. Ross. 1061; O. and B. Fedtsch. Perech. Rast. Turk. IV, 344, p. p.; Pavlov, Fl. Tsent. Kazakhst. III, 367.—*C. latifolia* Balb. ex Pers. Synops. II (1807) 377.—*Hieracium pannonicum* Jacq. Coll. V (1796) 148.—*Brachyderea rigida* (Waldst. and Kit.) Cass. in Dict. Sc. nat. XLVIII (1827) 430.—*Berinia pannonica* (Jacq.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 315.—*Hieracioides pannonicum* (Jacq.) O. Ktze. Rev. gen. I (1891) 345, "*Hieracioides*".—*Senecio glochidiatus* Prokh. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 432.—**lc.**: Waldst. and Kit.

l. c. t. 19; Rchb. Ic. Fl. Germ. XXIX, t. 1457; Hegi, l. c. Fig. 815; Javorka and Csapody, Iconogr. Fl. Hung. 563, fig. 4040; Prokhanov, op. cit. Fig. 2.—Exs.: Baenitz, Herb. Europ. sine numero; Fl. exs. austro-hung. No. 3409.

Perennial. Root long, woody, vertical. Caudex simple or with few short branches, covered with dark brown remnants of petioles of dead leaves. Stem one, less often several, 30–100(120) cm high, hard, straight, sulcate and ribbed, branched mostly at the apex or in the upper third with upward-spreading, usually not long, rather thick branches, terminating in one to three (eight) capitula on short, often grayish-tomentose peduncles, leafy, more or less lilac in the lower part, covered with dense to scattered, longer, whitish, eglandular, curved, stiff or somewhat stiff, simple hairs, sometimes mixed with woolly-arachnoid-hairy pubescence, pale green above, sparsely woolly-arachnoid-hairy or subglabrous, smooth, weakly scabrous often above (particularly peduncles) on ribs from occasional spinules. Basal and lower cauline leaves to 25(30) cm long (including petiole) and to 7(10) cm wide, oblong-obovate to oblanceolate, obtuse or acute, irregularly sinuate-toothed, sometimes lobed in the lower part, with triangular, triangular-lanceolate, less often oblongly lanceolate, acute or mucronate, entire (less often lower lobes with one or two teeth or on each side), often deflexed, mostly broad teeth, narrowed to short or more or less long-winged petiole, petiole broadened at the base; middle cauline leaves acuminate-ovate to oblong-lanceolate and lanceolate, acuminate or acute; irregularly sinuate-toothed to remotely small-toothed, sessile, amplexicaul, sagittate; upper cauline leaves strongly reduced, narrowly lanceolate to linear, with remote, acute, small teeth or entire, amplexicaul; apical leaves subulate linear, bracteiform; all leaves somewhat thick, compact, scabrous on both surfaces from numerous or scattered hairs, with longer and dense, whitish, eglandular, slightly stiff, hard, simple hairs usually beneath along midrib, sometimes leaves in addition scarcely woolly-arachnoid-hairy (mostly upper cauline leaves). Capitula in racemose-paniculate, or corymbose-paniculate inflorescence on straight or curved, mostly short and thick peduncles. Involucre campanulate, 10–13(15) mm long and 5–8(10) mm wide (at the beginning of flowering); involucre bracts grayish-arachnoid-hairy to densely grayish-tomentose on the outside, sometimes with occasional short, somewhat thick, spines on midrib, glabrous inside; outer involucre bracts (8)10–13, of unequal length, linear-lanceolate, acute, without scarious border, pale green or blackish, one-fourth to half as long as inner bracts; inner bracts 12–13, of equal length, oblong-lanceolate, subacute, with narrow, white scarious border (innermost), white hairy along upper, pale green or blackish in the middle, keeled at fruiting, base with spongy and hardened thickening.

Receptacle foveolate, walls of pits membranous ciliate above. Florets yellow, one and one-half to two times as long as involucre. Corolla 12–16 mm long; ligules to 3 mm wide; corolla tube 3.5–4.0 mm long; glabrous or pubescent above with fewer short or longer, hyaline hairs. Style branches yellow. Achenes all alike, dark reddish-brown (immature achenes yellowish-orange), (4.5)5.0–7.5 (less often to 8.5) mm long and 0.8–1.0 mm wide, fusiform, mostly slightly, strongly narrowed at the apex, straight or slightly curved, with 15–20 narrow, rounded, slightly thicker ribs reaching the achene apex and bearing very fine (visible under high magnification!), erect spiny hairs; pappus 6–8 mm long, whitish. Chromosomes $2n = 8$. Flowering July to August.

Steppes, stony slopes, among shrubs, sparse forests; forest-steppes and steppe zones and lower and middle mountain zones, up to 2,100 m.—*European Part*: Bessarabia (south), Black Sea Region, Middle Dnieper, Lower Don, Volga-Don, Trans-Volga, Volga-Kama (Kazan), Crimea (south); *Caucasus*: Ciscaucasia, Dagestan (Chir-Yurt, Kukurt-tau Ridge—Kukurt-Bash Mountain, Istisu-Kak Gorge, Tarki Tau Mountain, Dakhadaev District, between Urkarakh and Kubachi settlements), Eastern Transcaucasia, Western Transcaucasia (northern part), Southern Transcaucasia; *Western Siberia*: Upper Tobol (southwestern part). *General distribution*: Central Europe (southeastern part), Balkans (northern part), Iran (Karadag Range). Described from Hungary. Type in Vienna.

Note. A quite polymorphic species, which, despite its comparatively large range, apparently does not split off into smaller geographic races.

This species *Senecio glochidiatus* Prokh., recently described from Dagestan, is unrelated to the genus *Senecio* L. and to the subfamily Carduoideae Kitam., since all flowers in its capitulum are ligulate. This confirms its affinity with the subfamily Cichorioideae Kitam. In the original description of this species, one more inaccuracy has crept in. It is written there that the pubescence in this new species consists of anchorlike hairs (such as in the genus *Picris*), whereas, in actual fact, it consists of slightly uncinatate, stiff, simple hairs. Pubescence uncharacteristic of the genus *Senecio* L. compelled the author to include the Dagestan species in the separate section *Pseudopicris* Prokh. An examination of the type specimen and paratypes of *Senecio glochidiatus* Prokh. revealed that it must be relegated to the synonymy of the long established *C. pannonica* (Jacq.) C. Koch. True, in the corrigenda and errata to Volume XXI of the *Botanicheskikh Materialy Gerbarii Botanicheskogo Instituta imeni V.L. Komarova Akademii Nauk SSSR* [Botanical Materials of the Herbarium of V.L. Komarov Botanical Institute of the Academy of Sciences of the USSR], a correction has been inserted regarding the affinity of the published species from

Dagestan to the genus *Crepis* L. The recently published combination *Crepis glochidiata* (Prokh.) Prokh., in *Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR*, XXII (1963) 327, must also be considered a synonym of *C. pannonica* (Jacq.) C. Koch.

Subsection 2. Divaricatae (Babc.) Czer. comb. nova.—Sect. *Berinia* subsect. *Divaricatae* Babc. in Univ. Calif. Publ. Bot. 22 (1947) 212, excl. *C. dens-leonis* C. Koch (The Genus *Crepis*, 2).—Plants 3–50 cm high; basal leaves wider, to 3(5) cm wide, oblanceolate; cauline leaves fewer, usually smaller, linear or bracteiform. Stem slender, divaricately branched with fewer forked branches; Inflorescence lax. Capitula medium, with 15–80 florets; Involucral bracts grayish tomentose on the outside; less often, in addition, sparsely short-glandular hairy or scatteredly short-setose.

Type of subsection: *C. raulinii* Boiss.

21. *C. khorassanica* Boiss. Fl. or. III (1875) 835; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 477 (The Genus *Crepis*, 2); Nikitin in Fl. Turkm. VII, 348.—*Hieracioides khorassanicum* (Boiss.) O. Ktze. Rev. gen. I (1891) 346, "*Hieraciodes*".—**lc.**: Babc. l. c. fig. 124.

Perennial. Root vertical, with simple or branched caudex above, covered with remnants of petioles of dead leaves. Stem 7–11 cm high, shorter than basal leaves, with solitary, lateral, two-headed branch or slightly longer than basal leaves and then one-headed. Basal leaves 3–5 cm long and 0.5–0.7 cm wide, narrowly oblanceolate, toothed with deflexed teeth, gradually narrowed into winged petiole, more or less glaucous-green or short pubescent, with pale prominent midrib; cauline leaves fewer, linear or bracteal. Capitula erect, medium, with about 20 flowers, on 5–7 cm long peduncles, with one or two bracteiform leaves. Involucre campanulate, 10–13 mm long and 5 mm wide (at the base, at flowering time); involucral bracts densely grayish-tomentose; outer ones fewer, one to five (eight), of unequal length, lanceolate, half as long as inner ones, slightly scabrous; inner bracts 8–10, lanceolate, acute, usually with wide, pale, scarious border, dark green, with yellowish midrib, covered with short stiff bristles, setulose on the inside; receptacle ciliate, cilia to 1 mm long (before flowering). Florets probably yellow or reddish-purple on the outside of ligules but possibly pink-red. Corolla 12–15 mm long; corolla tube short (2 mm long before flowering), pubescent with yellowish, acicular, few-celled, 0.1–0.2 mm long hairs. Style branches 1.5 mm long before flowering. Achenes not known; pappus yellowish-white, basally reddish-brown, about 7 mm long with two or three rows (of equal length and width) of rather stiff but elastic bristles. Flowering July(?).

Upper mountain zone.—*Soviet Central Asia*: Possibly in mountainous Turkmenia (Kopetdag). *General distribution*: Iran (northeastern part). Described from Iran (Kuh-i-Nishapur Mountain between Nishapur and Mashhad). Type in Geneva.

Note. I have not seen this species. Its description is compiled from Babcock (l. c.).

Subsection 3. Strictae (Babc.) Czer. comb. nova.—Sect. *Berinia* subsect. *Strictae* Babc. in Univ. Calif. Publ. Bot. 22 (1947) 212 (The Genus *Crepis*, 2).—Plants 15–45 cm high; basal and lower cauline leaves linear to narrowly lanceolate, cauline leaves, as also basal, gradually reduced toward the apex. Stem slender, branched with fewer, long, upward-spreading branches. Inflorescence lax corymbose or racemose-corymbose. Capitula medium or rather small, with 11–40 flowers. Involucral bracts grayish-tomentose on the outside, sometimes covered with fewer bristles.

Type of subsection: *C. turcomanica* Krasch.

22. ***C. turcomanica*** Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 2 (1933) 181; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 483, p. p. (The Genus *Crepis*, 2); Nikitin in Fl. Turkm. VII, 318.—**lc.**: Babc. op. cit. fig. 127; Nikitin, op. cit. Plate LVI.

Perennial. Root long, woody, straight or curved. Caudex short, slender or thick, mostly branched, covered with brown remnants of petioles of dead leaves. Stem one to many, 15–40 cm high, more or less slender, straight or slightly arcuate, weakly ribbed, dichotomously branched usually from slightly below the middle, with upward-spreading, mostly simple, long and thin branches, leafy densely pubescent below, with short glandular hairs like basal and lower cauline leaves, sparsely woolly arachnoid-hairy above, less often subglabrous in the upper part. Basal and lower cauline leaves to 15(17) cm long (including petiole) and 0.7–1.5(2.0) cm wide, oblanceolate, acute or acuminate, with remote small teeth or pinnatilobate with unequal, narrow, lanceolate or linear, wider at base, acuminate, entire, deflexed teeth or 0.1–1.0 cm long lobes, narrowed into very short-winged petioles broadened at the base; middle
644 cauline lanceolate or linear, acuminate, remote pinnatilobate to entire, sessile, semiamplexicaul, sometimes amplexicaul and then auriculate pointed; both surfaces weakly woolly, arachnoid-hairy, mixed with mostly fewer, short, glandular hairs; uppermost cauline leaves strongly reduced, narrowly or subulately linear. Capitula in lax simples corymbose or racemose-corymbose inflorescence, on straight or slightly arcuate, smooth, slightly scabrous along ribs often in the upper part from sparse spinules or bristles, grayish tomentose below capitula, on long and slender

peduncles. Involucre campanulate, 12–15 mm long and 6–8 mm wide (at the beginning of flowering); involucre bracts grayish tomentose on the outside, sometimes with fewer, small, dark or pale, somewhat thick bristles along midrib, glabrous on the inside; outer bracts four to six, of unequal length, linear, acute, without scarious border, dark green, one-third to two-thirds as long as inner; inner bracts 10–13, of equal length, oblong-lanceolate, subacute, with white scarious border (innermost), white-hairy on the upper margin, dark- or blackish-green in the middle, keeled outside at fruiting, thickened and hardened at the base. Receptacle foveolate, walls of pits membranous, long-ciliate above. Florets yellow, one and one-half times as long as involucre. Corolla 12–18 mm long, ligules to 2.5 mm wide; corolla tube 4–6 mm long, pubescent with fewer short, acicular, coarse, hyaline hairs. Style branches yellow. Achenes all alike, brownish-yellow, 6.5–8.0(8.5) mm long and 0.8–1 mm wide, fusiform, slightly strongly narrowed toward the apex, straight or slightly curved, with 15–17 narrow, rounded, slightly thicker ribs, reaching the achene apex and covered with very fine (visible under high magnification!), erect spiny hairs; pappus 6–8 mm long, white. Flowering July to August.

Stony and rubbly steppe slopes, among thickets of shrubs, dry steppe mountain zone, at 1,500–2,600 m.—*Soviet Central Asia*: mountainous Turkmenia (Central Kopetdag). Endemic. Described from central Kopetdag. Type (lectotype), duplicate of the type and paratypes in Leningrad.

Section 6. *Macropodes* Bab. in Univ. Calif. Publ. Bot. 22 (1947) 212 (The Genus *Crepis*, 2).—*Crepis* sect. *Hieracioides* Froel. in DC. Prodr. VII, 1 (1838) 167, p. min. p.—*Crepis* sect. *Intybellioides* auct. p. min. p. non Froel.; Ldb. Fl. Ross. II, 2 (1846) 844, "*Intybellioides*".—*Berinia* subgen. *Leucoberinia* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 315, p. min. p.—*Berinia* subgen. *Melanoberinia* Sch. Bip. ibid. (1866) 315 p. min. p.—*Crepis* sect. *Omalocline* (Cass.) Benth. in Benth. and Hook. f. gen. pl. II (1873) 515, p. p.—*Crepis* sect. *Eucrepis* §2. *Fusifforme* Boiss. Fl. or. III (1875) 831, p. min. p.—*Crepis* sect. *Eucrepis* §3. *Praemorsae* Boiss. ibid. (1875) 831, p. min. p.—*Crepis* sect. *Catonia* O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374 p. p.—Perennials, pubescent. Root woody, vertical or oblique. Caudex leafy, simple or short-branched. Stems one to six, less often numerous, erect, more or less slender, 5–20(30) cm high, simple or branched; with one to three (four) branches, leafless or sparsely leafy. Basal leaves numerous, oblong-ob lanceolate or oblanceolate, sinuate-small-toothed and runcinately pinnatilobate to pinnatiely divided, short-petiolate, cauline leaves absent or one or two (three), usually strongly reduced, bracteiform.

Capitula medium or rather small, with many florets, one to five. Outer involucre bracts half to one-third as long as inner; inner bracts pubescent on inner surface, slightly keeled on the outside at fruiting, slightly thickened at the base. Receptacle foveolate and ciliate-fimbriate or foveolate and glabrous. Corolla 10.5–22.0 mm long, corolla tube 3.5–7.0 mm long, sparsely pubescent with very small conical hairs. Achenes all alike, black or reddish-black, 4.5–7.0(8.0) mm long, fusiform, more strongly narrowed toward the apex, without beak, with 10–20 longitudinal ribs; pappus white, 4–10 mm long.

Type of section: *C. oreades* Schrenk.

23. *C. willdenowii* Czer. nom. nov.—*C. pinnatifida* (Willd.) Froel. in DC. Prodr. VII, 1 (1838) 167; Boiss. Fl. or. III, 840; Grossh. Fl. Kavk. IV (1934) 262 and Opred. Rast. Kavk. 518; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 496 (The Genus *Crepis*, 2) non Willd. (1803).—*Hieracium pinnatifidum* Willd. Sp. pl. III, 3 (1803) 1560.—*Hieracioides pinnatifidum* (Willd.) O. Ktze. Rev. gen. I (1891) 346, "*Hieracioides*".—*Ic.*: Bab. op. cit. fig. 133.

Perennial. Root long, woody, vertical or oblique. Caudex 2–6 cm long, simple or short-branched, covered with dark brown remnants of petioles of dead leaves. Stem (one)two to six, 5–12(16) cm high, rather slender, erect, straight or slightly arcuate, cylindrical, indistinctly sulcate, hollow, simple, leafless, sometimes with one very small, scale-like cauline leaf in the middle, grayish-tomentose, usually mixed with short, yellowish, setaceous hairs, more densely in the upper part of stem. Basal leaves numerous, to 7(9) cm long (including petiole) and 1.5–2.0 cm wide, oblong-ob lanceolate, pinnatisect to triangular small segments with sparse acute teeth, narrowed into short, winged petiole broadened at the base, densely grayish-tomentose on both surfaces, leaf segments and their teeth with small, stiff cusp at the apex, with more or less dense, short, yellowish spinules along margin. Capitula solitary, erect, involucre campanulate, 12–14 mm long and 7–9 mm wide (at fruiting); involucre
646 bracts oblong-lanceolate, acuminate appressed grayish-tomentose on the outside, covered with short, reddish-brown or blackish, glandular, setaceous hairs; outer involucre bracts seven to nine, appressed or somewhat deflexed, of unequal length, without scarious border, half as long as inner, usually without setaceous hairs; inner bracts 13, wider, of equal length, with white scarious border, pubescent on the inside, more or less densely short-appressed hairy, keeled outside at fruiting, with indistinct spongy thickening at the base. Receptacle foveolate, walls of pits ciliate-fimbriate above. Florets yellow, almost two times as long as involucre. Corolla 16–18 mm long; ligule 2.0–2.5 mm wide; corolla tube 4.0–5.5 mm long, sparsely pubescent from very fine conical hairs.

Style branches yellow. Achenes all alike, black, 6–7 mm long and 1.0–1.2 mm wide, fusiform more strongly narrowed toward the apex, straight or slightly curved, with about 20 narrow rounded, ribs reaching achene apex and bearing very small (visible under high magnification!), erect, spiny hairs; pappus 8–9 mm long, white, yellowish at base, soft, persistent. Flowering July to August.

Talus; alpine zone of mountains.—*Caucasus*: Southern Transcaucasia (mountains in the vicinity of Lake Sevan). *General distribution*: Armenia and Kurdistan (northwestern part), Asia Minor. Described from Turkish Armenia. Type in Berlin.

Note. This species was reported by Papava (*Fl. Gruzii*, VIII, 700) from Georgia under the name *C. pinnatifida* (Willd.) Froel. The report needs to be verified.

24. *C. alikeri* Tamamsch. in Addenda XXVIII, 756.

Perennial. Caudex short, mostly simple, covered with dark brown remnants of petioles of dead leaves. Stems one or two, 8–10 cm high, slender, straight or somewhat curved, cylindrical, indistinctly sulcate, hollow, leafless grayish-tomentose with mixture of short, yellowish, glandular, somewhat stiff, setaceous hairs. All leaves basal, numerous, to 7 cm long (including petiole) and 1.5–2 cm wide, oblong-ob lanceolate, pinnately divided into small deltoid segments with remote acute teeth, narrowed into short, narrow-winged petiole, broadened at the base, grayish-green above, finely tomentose, grayish tomentose beneath; leaf segments and their teeth with small yellow cusp at the apex, with sparse, short, yellowish, eglandular, somewhat stiff setaceous hairs along margin. Capitula solitary, erect. Involucre campanulate, 12–13 mm long and about 8 mm wide (at flowering time); involucre bracts oblong-lanceolate, acuminate, appressed grayish-tomentose on outer surface; outer involucre bracts appressed or somewhat deflexed, of unequal length, without scarious border, half as long as inner; inner bracts wider, of equal length, with very narrow, white scarious border, covered with very short blackish glandular, stiff setaceous hairs on the outside in the middle part (covered with very short blackish) white hairy along the upper margin, pubescent
647 on the inside with short appressed hairs. Florets pale pink (when dry), two times as long as involucre. Corolla 20–22 mm long, ligules 2.5–3.0 mm wide; corolla tube 6–7 mm long, sparsely pubescent with very small conical hairs. Style branches yellow. Achenes immature; pappus 8–10 mm long, white. Flowering July.

Stony talus, alpine mountain zone.—*Caucasus*: Eastern Transcaucasia (Kypaz Mountain). Endemic. Described from Azerbaidzhan SSR, from Kypaz Mountain. Type in Leningrad.

Note. It differs from the very similar species *C. willdenowii* Czer.

by pale pink, larger florets, grayish green on the upper surface and less weakly pubescent leaves, as well as leaf segments bearing sparse, much less stiff, setaceous hairs along the margin. So far, *C. alikeri* Tamamsch. is known from Kyapaz Mountain of Azerbaidzhan SSR.

25. *C. oreades* Schrenk in Fisch. and Mey. Enum. pl. nov. II (1842) 32, p. p. excl. α . *cinerascens* Schrenk; Ldb. Fl. Ross. II, 2, 826, p. p.; O. and B. Fedtsch. Perech. Rast. Turk. IV, 345, p. p.; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 499, p. p. excl. m. v. 1 (The Genus *Crepis*, 2); Kovalevskaja in Fl. Uzb. VI, 493.—*C. oreades* var. *turkestanica* O. and B. Fedtsch. op. cit. (1911) 345.—*C. sonchifolia* var. *turkestanica* Winkl. in schedis.—*Hieracioides oreades* (Schrenk) O. Ktze. Rev. gen. I (1891) 345, "*Hieracioides*".—*lc.*: Bab. op. cit. fig. 135, a-i and pl. 9, d; Kovalevskaya, op. cit. Plate L, Fig. 1.

Perennial. Root woody, vertical or oblique. Caudex 1–3 cm long, simple or short-branched, covered with dark brown or brown remnants of petioles of dead leaves. Stem (one)two to six, less often more numerous, 6–20(30) cm high, more or less slender, erect or ascending, straight or arcuate, cylindrical, indistinctly sulcate, hollow, simple or weakly forked, leafless with one or two very small, narrowly linear or bracteal leaves with rather large cauline leaf often in the lower fork or branches, like basal leaves, green, entirely lax arachnoid-woolly, often scabrous above from remote, short, dark green spines or longer eglandular, setaceous hairs, sometimes subglabrous. Basal leaves numerous, to 8(10) cm long (including petiole) and 0.5–2.0 cm wide, less often larger, oblanceolate or oblong-oblanceolate, obtuse or acute, sinuate-small-toothed, runcinately pinnatilobate or deeply pinnatipartite with deltoid to linear-lanceolate, acute, enite or with remotely small-toothed lobes or segments, narrowed into short, winged petiole, broadened at the base, light green, mostly weakly arachnoid-woolly on both surfaces or glabrous, smooth or scabrous along margin from usually remote, obtuse tubercles or very fine and acute, yellowish spinules. Capitula erect, one to three (five). Involucre campanulate, 9–12 mm long and (6)7–9 mm
648 wide (at fruiting); involucre bracts grayish arachnoid-hairy pubescent on the outside, mostly with fewer, long, dark green or blackish, eglandular, setaceous hairs along midrib, less often with spinules; outer involucre bracts six to eight, of unequal length, linear-lanceolate, acute, without scarious border (half)one-third as long as inner; inner bracts (10)12–13, of equal length, oblong-lanceolate, acute or subobtuse, with scarious border (innermost), pubescent on inner surface from dense, short-appressed hairs, indistinctly keeled outside at fruiting, scarcely thickened at the base. Receptacle foveolate, glabrous. Florets yellow, almost two times as long as involucre. Corolla 10.5–16.0 mm long; ligules

to 3 mm wide; corolla tube 3.5–5.0 mm long, sparsely pubescent from very fine conical hairs. Style branches yellow. Achenes all alike, reddish-black, (immature yellow-orange) 4.5–6.0(8.0) mm long and 0.8–1.0 mm wide, fusiform, somewhat strongly narrowed toward the apex, straight or curved, with 10–13 well developed, rounded ribs reaching the achene apex and bearing very fine (visible under high magnification!) erect, spiny hairs; pappus 4–6 (7) mm long, white, soft, persistent, Chromosomes $2n = 8$. Flowering June to August.

Rocks, stony and rubbly slopes, talus and river gravel beds, at (1,800) 2,600–4,000 m.—*Soviet Central Asia*: Balkhash Region (Ulatau Mountains), Dzhungaria-Tarbagatai, Tien Shan, Pamiro-Alai. *General distribution*: Dzhungaria-Kashgaria, Afghanistan (northeastern part). Described from Tarbagatai. Type and its duplicates in Leningrad.

Note. In Tarbagatai and Dzhungarian Alatau, along with typical plants of *C. oreades* Schrenk, we find individuals in which the leaves are grayish from a more or less dense tomentum and the leaves, stem, and involucre bracts are covered with a mixture of glandular and eglandular setaceous hairs. These specimens were described by Schrenk under the name *C. oreades* α *cinerascens* Schrenk op. cit. (1842) 33. A careful examination of all the herbarium material showed that these plants are not found in other parts of the range of this species. I am inclined to believe in their hybrid origin. However, I am still not clear about the second parent species. Babcock (op. cit., fig 135, k–t) has also illustrated this glandular setaceous-hairy variety.

26. **C. crocea** (Lam.) Bab. in Univ. Calif. Publ. Bot. 19 (1941) 400 and 22 (1947) 503 (The Genus *Crepis*, 2). —*C. gmelini* var. *grandiflora* Tausch in Flora XI, 1 (1828) 78. —*C. aurea* ξ . *crocea* Froel. ex DC. Proder. VII, 1 (1838) 168. —*C. pallasii* Turcz. in Bull. Soc. Nat. Mosc. XI (1838) 96 (Cat. baic. No. 714); Ldb. Popov, Fl. Ross. II, 2 (1846) 824 incl. β . *pumila* Ldb.: Popov, Fl. Sredn. Sib. II, 780. — *C. turczaninowii* C.A.M. ex Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 110 (Fl. baic.-dahur.). — *Hieracium croceum* Lam. Encycl. meth. II (1786) 360. — *H. crocatum* Bge. ex Ldb. op. cit. (1846) 825, pro syn. — *Berinia crocea* (Lam.) Sch. Bip. 649 Jahresberichth Pollichia XXII–XXIV (1866) 317. — *Hieracioides croceum* (Lam.). O. Ktze. Rev. gen. I (1891) 345, "*Hieracioides*". — **Ic.**: Gmel. Fl. sibirica II, t. VIII, fig. 1 Bab. op. cit. fig. 136, and pl. 9, a–c.

Perennial. Root Woody, vertical oblique; caudex 0.5–1.5 mm long, simple or branched, covered with dark brown remnants of petioles of dead leaves. Stems one to three (six), 5–20 (25) cm high, usually more or less slender, straight or slightly arcuate, cylindrical, indistinctly sulcate, hollow, simple or dichotomously branched, with one to three(four) branches bearing (one)two or three culling leaves, of which the lower

(one or two) larger, narrow, linear, entire, often like basal leaves, upper ones smaller, bracteiform, or leafless or almost leafless, green, weakly arachnoid-woolly throughout or subglabrous, sometimes more or less grayish below capitula and at the base from very fine, arachnoid-hairy tomentum, more or less scabrous in the upper part from numerous (mostly below capitula), either distant short glandular hairs or dark green, glandular setaceous hairs, less often mixed with glandular hairs. Basal leaves numerous, 1.5–8.0(10.0) cm long (including petioles) and 0.5–2.5 cm wide, oblanceolate, acute, runcinately pinnatilobate or deeply pinnatipartite, with deltoid to linearly lanceolate, acute, entire or remotely small-toothed lobes or segments; narrowed into short-winged petiole broadened at the base, light green, arachnoid-woolly on both surfaces or subglabrous, sometimes grayish in the lower part from lax arachnoid pubescence; margin smooth, sometimes with occasional obtuse tubercles or fine, acute, yellowish spinules. Capitula erect, one to five. Involucre campanulate, 10–15 mm long and 7–10 mm wide (at fruiting); involucre bracts grayish arachnoid-hairy pubescent on the outside with mostly dense, long, yellowish or greenish, eglandular setaceous hairs, in addition with shorter, usually numerous, pale or slightly reddish-brown, glandular hairs; less often without glandular hairs; outer bracts six to eight, of unequal length, linearly lanceolate, acute, without scarious border, one-third to two-thirds as long as inner; bracts 13, of equal length, oblong-lanceolate, acute or obtuse, with scarious border (innermost), pubescent on the inside with short appressed hairs, slightly keeled outside at fruiting, scarcely thickened at the base. Receptacle faveolate, with ciliolate fimbria. Florets yellow, almost two times as long as involucre. Corolla 13–18 mm long; ligules to 2.5 (3.0) mm wide. Corolla 13–18 mm long; ligules to 2.5 (3.0) mm wide. Corolla tube 3.5–5.0 mm long, pubescent from scattered very fine conical hairs. Style branches yellow. Achenes all alike, reddish-black (immature yellowish-orange), 5.5–65 (7.5) mm long and 0.8–1.0 mm wide, fusiform, somewhat strongly narrowed toward the apex, straight or curved, with 10–12 well developed, rounded, ribs reaching the achene apex and bearing very fine (visible under high magnification!), erect spiny hairs; pappus 6.5–7.0(8.0) mm long, soft, persistent. Chromosomes $2n = 16$. Flowering June to July.

Dry meadows, steppes, stony and rubbly slopes.—*Western Siberia*: Altai (basin of Chuya River); *Eastern Siberia*: Angara-Sayans (southern part), Dauria (southern part). *General distribution*: Mongolia (in south up to Nan-Shan and Alashan ranges).

Note. It differs from the very similar *C. oreades* Schrenk by a shorter caudex and larger involucre; the involucre bracts are covered on the outside with mostly dense and long, yellowish or greenish, eglandular, setaceous hairs and much shorter usually numerous, glandular hairs, that

pass on to the upper part of the stem, which often terminates in a foveolate, ciliolate-fimbriate receptacle.

Section 7. *Ixeridiopsis* Babc. in Univ. Calif. Publ. Bot. 22 (1947) 212 (The Genus *Crepis*, 2). —*Barkhusia* sect. *Aegoseris* (Rchb.) DC. Prodr. VII, 1 (1838) 154, p. min. p.—*Youngia* auct. p. min. p. non Cass.: Ldb. Fl. Ross. II, 2 (1846) 836.—*Crepis* sect. *Youngia* (Cass.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 514, p. min. p.—Perennial. Plants entirely glabrous (only in *C. corniculata* Rgl. and Schmalh., involucre bracts and peduncles pubescent), glaucescent. Root elongated, vertical, terminating above in simple or branched woody rhizome. Stems few to many, less often solitary, mostly flexuous, 3–40 cm high, strongly branched from the base or middle, with slender branches, leafy. Basal and lower cauline leaves obovate to oblanceolate, sometimes with rounded or broad elliptical lamina, entire to lyrate pinnatifid, less often pinnatisect, with slender petioles; middle and upper cauline leaves, as also basal and lower cauline leaves, either very small, narrowly lanceolate, linearly lanceolate or narrowly linear, petiolate or sessile, Capitula small or medium, with 9–13 florets, numerous. Outer involucre bracts four to six(seven), one-eighth to one-fourth(one-third) as long as inner; inner bracts 8–10, glabrous on the inside. Receptacle foveolate, glabrous. Corolla 7–15 mm long, with 3–5 mm long tube, glabrous, less often with scattered very fine, conical hairs. Achenes all alike, yellowish or yellowish-reddish brown, 4.5–8.0 mm long and 0.4–0.6(1.0) mm wide, fusiform, slightly narrowed at both ends or attenuated above into very short (about 1 mm long) beak-like extension, slightly broadened at the apex, with 10(13) longitudinal ribs; pappus white, 4–9 mm long.

Type of section: *C. nana* Richardson.

27. ***C. corniculata*** Rgl. and Schmalh. in Izv. Obshch. Lyubit. Estestv. Antrop. in Etnogr. 34, 2 (1882) 54; O. and B. Fedtsch. Perech. Rast. Turk. 651 IV, 344; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 531 (The Genus *Crepis*, 2); Kovalevskaya in Fl. Uzb. VI, 497.—*Hieracioides corniculatum* (Rgl. and Schmalh.) O. Ktze. Rev. Gen. I (1891) 345, "*Hieraciodes*".—*l.c.*: Babc. op. cit. fig. 149.

Perennial. Plants glabrous except involucre bracts, peduncles and leaf axils, glaucescent. Root extending above into woody, vertical, branched or simple rhizome with numerous scaly remnants of dead leaves and vegetative buds. Stems few, less often solitary, (20)30–40 cm high, flexuous cylindrical, longitudinally striped, solid, paniculately branched from the base, sometimes from middle, leafy, mostly violet in the lower part. All leaves cauline, sessile, pubescent in axils with long, multicellular, entangled, whitish hairs, fleshy, lower and middle cauline leaves 2–

4.5.0(5.5) cm long and 0.7–1.7(2.0) cm wide, oblong-obovate, oblong-elliptical, oblong or oblong-lanceolate, obtuse to acute, sinuate-toothed or irregularly small-toothed with chondroid obtuse teeth or denticles, apical leaves strongly reduced, bracteiform, narrowly linear, short-acuminate, entire, plicate along midrib. Capitula with 10–12 florule, on slender, straight or slightly curved, scatteredly arachnoid-hairy, 0.1–1.5(2.0) cm long peduncles; aggregated into panicle inflorescence. Involucre cylindrical-campanulate, 9–11 mm long and 2–3 mm wide (at flowering time); involucre bracts whitish tomentose or whitish arachnoid-hairy on the outside; outer involucre bracts five or six, of unequal length, ovate to ovate-lanceolate, obtuse or acute, more or less thin, without scarious border, one-sixth to one-fifth as long as inner; inner bracts 8–10, of equal length, linear-oblong, subacute, with white scarious border (innermost), weakly keeled on the outside, with thick, yellowish-green, well-developed subterminal corolla, glabrous on the inner surface. Receptacle foveolate, glabrous. Florets yellow, one and one-half times as long as involucre. Corolla 10–11 mm long; ligules to 2 mm wide; corolla tube 4.5 mm long, glabrous. Style branches yellow. Achenes all alike, yellowish-reddish brown, 4.0–4.5 mm long and 0.5–0.6 mm wide, fusiform, slightly narrowed at both ends, slightly broadened at the apex, with 10 rounded, strongly scabrous (under very high magnification!) ribs; pappus 5.5–6.5 mm long, white, persistent. Flowering July to August (Plate XXXI, Fig. 2).

Gravel-beds, stony-sandy and sandy areas on the floodplains of rivers; at (1,750) 2,200–3,000 m.—*Soviet Central Asia*: Pamiro-Alai (eastern part), Tien Shan (Atabashi River—left tributary of Naryn River, Oigang River basin in Tashkent Region). *General distribution*: Iran (areas of Afghanistan adjoining the Pamir). Described from the Alai Range. Type in Leningrad.

28. **C. flexuosa** (Ldb.) Clarke, Compos. Ind. (1876) 254; B. Fedtsch. Rast. Turk. (1915) 765; Babč, in Univ. Calif. Publ. Bot. 22 (1947) 534
 652 (The Genus *Crepis*, 2)—*C. krylovii* Schischk. in Kryl. Fl. Zap. Sib. XI (1949) 3045,—*C. kusnezovii* Pavl. in Vestn. Akad. Nauk KazSSR, 3 (1950) 39.—*Prenanthes polymorpha* γ. *flexuosa* Ldb. Fl. alt. IV (1833) 145.—*Barkhausia flexuosa* (Ldb.) DC. Prodr. VII, 1 (1838) 156.—*B. flexuosa* β. *lyrata* Schrenk in Fisch. and Mey. enum. pl. nov. I (1841) 39.—*Youngia flexuosa* (Ldb.) Ldb. Fl. Ross. II, 2 (1846) 838; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515; O. and B. Fedtsch. Perech. Rast. Turk. IV, 349.—*Y. glauca* Edgew. in Trans. Linn. Soc. XX (1846) 79; Benth. in Benth. and Hook. f. op. cit. 515.—*Y. flexuosa* var. *gigantea* Winkl. ex O. Fedtsch, in Tr. Pererb. Bot. Sada, XXI, 3 (1903) 369, nomen (Fl. Pamira); O. and B. Fedtsch. op. cit. 349, nomen.—*Y. flexuosa* var. *lyrata* (Schrenk) O. and B. Fedtsch. op. cit. (1911) 349.—*Hieracioides*

flexuosum (Ldb.) O. Ktze. Rev. gen. I (1891) 346.—"*Hieraciodes*".—**Ic.:** Ldb. Ic. pl. Fl. Ross. V, t. 498; Bab. op. cit. fig. 151 and pl. 11; Pavlov, op. cit. Fig. 14.

Perennial. Plant entirely glabrous, glaucescent. Root elongated, vertical, terminating above into vertical, simple in young plants, branched in older, woody, 1.5–10 mm thick rhizome. Stems few or numerous, 5–30 cm high, cylindrical, longitudinally striped, solid, strongly divaricately branched from base with slender divaricate branches, leafy, sometimes violet below. Basal and lower cauline leaves 2.5–6.5 cm long (including petiole) and 0.7–1.5(1.6) cm wide, from oblanceolate to abovate, acute, subacute or obtuse, irregularly sinuate-toothed, lyrate pinnatifid, sometimes pinnately divided, with triangular or almost oblong, mostly acute, irregular, one or two teeth on each side, less often entire, usually with obliquely antrorse lobes or segments, gradually narrowed into slender petiole as long as, slightly shorter or longer than lamina, early-withering (particularly basal leaves); middle and upper cauline leaves less often lower cauline linearly lanceolate or narrowly linear, entire, as also basal and lower cauline leaves sessile, or middle cauline short petiolate, apical leaves very small. Capitula with 9–13 florets, on very slender, slightly curved or straight, (0.5)1.0–3.0(4.0) mm long peduncles, aggregated in many-headed, compound, lax corymbose inflorescence. Involucre cylindrical, 6–9(10) mm long and 1.5–3.0 mm wide (at flowering time), outer involucre bracts four to six, of unequal length, ovate or ovate-lanceolate, subacute or acute, without scarious border, one-sixth to one-eighth as long as inner ones; inner bracts eight, of equal length, linear-oblong, subacute, with white scarious border (innermost), slightly keeled outside, without subterminal cornicle, but often with weakly developed tubercular thickening, crisped short-hairy along the upper margin, glabrous on the inner surface. Receptacle foveolate, glabrous. Florets yellow, ligules sometimes with pink teeth or fast turning pink, one and one-half times as long as involucre. Corolla 9–10(11) mm long; ligules to 2 mm wide; 553 corolla tube about 3.5 mm long, glabrous or with scattered, very small, conical coarse hairs. Style branches yellow. Achenes all alike, yellowish-reddish-brown, 4.5–6.0 mm long and 0.4–6.0 mm wide, fusiform, slightly narrowed at both ends or attenuated above into very short (about 1 mm long) beak-like extension, slightly broadened at the apex, with 10 rounded, strongly scabrous or very finely spiny hairy (under high magnification!) ribs; pappus 4.0–5.5 mm long, white, persistent but rather readily detaching on contact. Chromosomes $2n = 14$. Flowering June to August.

Stony and rubbly slopes and talus, gravel-beds along rivers, up to 4,000 (4,300) m.—*Western Siberia:* Altai (Kaldzhira River valley); *Soviet Central Asia:* Dzhungaria-Tarbagatai, Tien Shan (east of Lake Issyk-Kul, Karatau Mountains in western Tien Shan), Pamiro-Alai (Alai and Trans-

Alai ranges, Pamir, Darvaz, Zeravshan—Makshevat Gorge). *General distribution*: Dzhungaria-Kashgaria, Mongolia, Tibet (Si-tiang, western Tibet), Indo-Himalayas (western Himalayas). Described from Arkaul and Chingistan mountains. Type and topotypes in Leningrad; duplicate of type in Geneva.

Note. Besides the varieties cited in synonymy which do not have taxonomic significance, O. and B. Fedtschenko (op. cit.) report for this species one more variety under the name *Youngia flexuosa* var. *corniculata* Winkl. Specimens of it with K. Winkler's label could not be located in the Herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad. Among all the rather numerous specimens of *C. flexuosa* (Ldb.) Clarke examined by me, I did not find a single specimen with a well-developed terminal cornicle on the inner involucre bracts. Hence, the actual existence in nature of this undescribed variety is highly doubtful.

All earlier investigators considered De Candolle (the father) as the author of *C. flexuosa*, whereas in reality, its author is Ledebour, who described this plant five years before De Candolle under the name *Prenanthes polymorpha* γ. *flexuosa* Ldb. De Candolle is the author of the combination *Barkhausia flexuosa* (Ldb.) DC.

29. *C. alaica* Krasch. in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, I (1933) 183; Babč. in Univ. Calif. Publ. Bot. 22 (1947) 532 (The Genus *Crepis*, 2).—**lc.**: Babč. ibid. fig. 150.

654 Perennial. Plant glabrous, pubescent only in leaf axils with multicellular, long, entangled, whitish hairs, glaucescent. Root extended above into oblique or vertical, slender or rather thick, woody, sparsely branched, less often simple, long rhizome, as also thin brown scale-like remnants of leaves concealed in rubble at base of stems, bearing vegetative buds. Stems one to three, 4–10(15) cm high, flexuous, cylindrical, solid, divaricately branched from the base or middle, with more or less thick, secondarily branched branches, mostly nonfastigate, leafy, often violet in the lower part. Basal and lower cauline leaves 1.5–3.5 cm long (including petiole) and 0.7–1.5(2.0) cm wide, obovate or oblongly obovate, obtuse to subacute, with irregular large teeth, or pinnatilobate, with more or less approximate, acute teeth, or with irregular, acute and coarse-toothed, wide lobes, gradually narrowed into wide petiole, petiole considerably shorter than lamina, fleshy; middle and upper cauline leaves as also basal and lower cauline, elliptical to oblong, sessile or partly indistinctly petiolate, apical leaves smaller. Capitula with 9–10 florets on very short peduncles, in clusters of two to four, in lax paniculate-corymbose or compound corymbose inflorescence. Involucre cylindrical-campanulate, 10–11 mm long and 2–3 mm wide (at flowering time), short-hairy along upper margin;



outer involucre bracts five to seven, of unequal length, ovate or ovate-lanceolate, subacute, more or less thin, without scarious border, one-fifth to one-fourth as long as inner; inner bracts 8–10, of equal length, linearly oblong, subacute, white, often with pink scarious border (innermost) above, weakly keeled with dark green, weakly developed, subterminal tubercular thickening on the outside, glabrous on the inner surface. Receptacle foveolate, glabrous. Florets orange-yellow, ligule sometimes with pink teeth or readily becoming pink, one and one-half times as long as involucre. Corolla 10.0–17.5 mm long, ligule up to 2.5(3.0) mm wide; corolla tube 4–5 mm long sparsely covered with fine conical, acicular, coarse hairs, Style branches yellow. Achenes all alike, yellowish-reddish brown, 7.0–7.5 mm long, and 0.5–0.6 mm wide, fusiform, strongly narrowed above, very slightly broadened at the apex, with 10 rounded, indistinctly transversely rugose (under high magnification!) ribs; pappus 5.5–5.6 mm long, white, persistent, Flowering July to August.

Gravel-beds along riverbanks, stony talus; in alpine mountain zone.—*Soviet Central Asia*: Pamiro-Alai (Alai, Trans-Alai ranges, vicinity of Lake Kara-Kul, Ak-Baytal Pass). *General distribution*: Dzhugaria-Kashgaria (Kashgaria-Sarykol Ranges, Pistan Gorge). Described from Alai Range. Type and its duplicate and paratypes in Leningrad.

Note. I.M. Krascheninnikov (op. cit.) in describing *C. alaica* Krasch., did not indicate precisely the type specimen, but in the herbarium he marked in this capacity the first of the specimens listed by him, which were collected by S.I. Korshinsky from the Touz-Kungei River in the Alai Range.

To date, this species has been reported only from the Alai Valley. However, specimens from the vicinity of Lake Kara-Kul, Ai-Baytal Pass, and the Sarykol Range undoubtedly belong to *C. alaica* Krasch.

656 *C. alaica* Krasch. apparently is very close to the Tien Shan-Altai *C. karelinii* M. Pop. and Schischk. ex Czer., but differs from it by more or less thickish branches, shorter and wider petioles, a different shape and incision of the leaves, a shorter pappus, and other less apparent characters. It shows much less affinity to the western Himalayan *C. naniformis* Bab.

30. *C. karelinii* M. Pop. and Schischk. in Popova, Fl. Almat. Zaponedn. (1940) 50, nomen; descr. nostra in Addenda XXVIII, 757.—*C. nana* var. *laxa* Kryl. Fl. Alt. III (1904) 763 and Fl. Zap. Sib. XI, 3044.—*C. pygmaea* auct. p. p. non L.: B. Fedtsch. Rast. Turk. (1915) 765. —*C. nana* ssp. *typica* Bab. in Univ. Calif. Publ. Bot. 22 (1947) 540, p. min. p. (The Genus *Crepis*, 2).—*Youngia pygamea* Y. *dentata* Ldb. Fl. Ross. II, 2 (1846) 838; O. and B. Fedtsch. op. cit. (1991) 350.—*Y. pygmaea* var. *lyrata* auct. non Ldb.: O. and B. Fedtsch. op. cit. (1911) 350.—*Y. pygmaea* var. *caulescens* Rupr. in Osten-Sacken et Rupr. Sert.

tiansch. (1869) 59; O. and B. Fedtsch. op. cit. 350.—*Y. pygmaea* auct. on Ldb.: Kovalevskaya in Fl. Uzb. VI (1962) 498, excl. syn.

Perennial. Plants entirely glabrous. glaucescent, root long, thin, vertical, extended above into short, vertical, branched, less often simple, woody, 1.5–4.0 mm thick rhizome. Stems few, 4–10 cm high, cylindrical, longitudinally striped, solid, branched from the middle or almost from base, with slender branches, leafy. Basal and longer cauline leaves 2–7 cm long (including petiole) and 0.5–1.5(2.0) cm wide, oblanceolate, elliptical or oblong-oblanceolate (less often obovate), acute, subacute or obtuse, with remote small teeth, irregularly sinuate-toothed, lyrate-pinnatilobate, sometimes almost pinnatipartite or entire, mostly gradually narrowed into slender petiole, petiole as long as lamina, slightly shorter, less often longer than lamina; middle cauline leaves 1.5–5.0 cm long like basal and lower cauline leaves, sometimes as also upper cauline, narrowly oblanceolate or linearly lanceolate, acute or subacute, entire, short-petiolate or sessile. Capitula 9–10, aggregated in lax compound corymb. Involucre cylindrical-campanulate, (8)10–13 mm long and 3–4 mm wide (at flowering time). Outer involucre bracts four or five, of unequal length, ovate or ovate-lanceolate, acute, without scarious border, one-eighth to one-sixth as long as inner ones; inner bracts eight, of equal length, linear-oblong, subacute, with white scarious border (innermost), weakly keeled, without subterminal corniculate process on the outside, crisped short-hairy along upper margin, glabrous on the inner surface. Receptacle glabrous. Florets yellow; sometimes fast turning pink, one and one-half times as long as involucre. Corolla 11–14 mm long; ligules to 2.0(2.5) mm wide; 657 corolla tube 3.5–4.0 mm long, glabrous or sparsely covered with very fine, conical, coarse hairs. Style branches yellow. Achenes all alike, yellowish, 4.5–8.0 mm long and about 0.5 mm wide, fusiform, slightly narrowed at both ends or attenuated above into short (about 1 mm) beak-like projection, slightly broadened at apex, with 10 rounded, acute, scabrous (under high magnification! ribs; pappus (6)7–9 mm long, white, persistent. Flowering July to August. (Plate XXXI, Fig. 1).

Moraine deposits near glaciers, gravel-beds along riverbanks; alpine mountain zone.—*Soviet Central Asia*: Tien Shan (in west up to Talass Range); *Western Siberia*: Altai (Chuya alpine summits, Kurai, Chuya and Naryn ranges). *General distribution*: Dzhugaria-Kashgaria (Kashgaria—between Turgart Pass and Kashgar Mountain), Tibet (Tsinghai—Lake Kukunor). Described from Trans-Ilian Alatau (Chilik River, Togus-Tau gravel). Type in Leningrad.

Note. This predominantly Tien Shan plant has until now been identified with *C. nana* Richardson, from which it differs very reliably, however, by a stem less densely leafy in the lower part; leaves that are gradually narrowed into the petiole that is as long as, slightly shorter, or,

less often, longer than the lamina; a lax inflorescence, larger involucre, wider inner involucral bracts, longer florets, one and one-half times as long as the involucre, and longer pappus. *C. karelinii* M. Pop. and Schischk. ex Czer. apparently is much closer to *C. alaica* Krasch. (cf. note to the latter species).

31. *C. sogdiana* (Krasch.) Czer. comb. nova.—*Youngia sogdiana* Krasch. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, IX, 4–12 (1946) 184.—**lc.**: Krasch. *ibid.* Fig. 12 on p. 183.

Perennial. Plant entirely glabrous, violet-glaucous. Stems few, with slender, brown, scale-like remnants of dead leaves and vegetative buds concealed in rubble at the base of stem, 7–10 cm high, flexuous, slightly flattened, longitudinally striped, solid, branched from the middle or base with more or less thickish, secondarily branched branches, fastigate, leafy. Leaves with reticulate venation beneath; lower and middle cauline leaves 2.5–5.0 cm long (including petiole), abruptly narrowed into wide petiole as long as or slightly shorter than lamina, lamina 1.5–3.5 cm long and 1.0–3.5 cm wide, rotund or roundish-ovate, with remote small teeth and somewhat thick, chondroid, obtuse teeth; upper cauline leaves smaller, elliptical, with short cusp, entire, short-petiolate or sessile. Capitula with fewer flowers, on short, slender, mostly slightly curved peduncles, aggregated in lax corymbose inflorescence. Involucre cylindrical-campanulate, 12–14 mm long and 4–5 mm wide (at flowering time); involucral bracts short-hairy along upper margin; outer bracts five or six, of unequal length, ovate or oblongly lanceolate, acute, thin, without
658 scarios border, and one-sixth to one-fifth as long as inner; inner bracts eight, of equal length, linear-oblong, subacute, with white scarios border (innermost), without subterminal corniculate process outside, glabrous on inner surface. Receptacle glabrous. Florets yellow when dry, ligules with pink teeth, one and one-half times as long as involucre. Corolla 13–15 mm long; ligules up to 3 mm wide; corolla tube about 5 mm long, glabrous. Style branches yellow. Achenes all alike, yellowish-reddish brown, 7–8 mm long and about 1 mm wide, fusiform, scarcely narrowed above, slightly broadened at the apex with 10 rounded, slightly scabrous (under high magnification!) ribs; pappus 6–8 mm long, white, persistent. Flowering July (Plate XXX, Fig. 2).

Stony talus of sandstones; at 3,380 m.—*Soviet Central Asia*: Pamiro-Alai (Turkestan Range, near village of Oburdon). Endemic. Described from above locality. Type and its duplicate Leningrad.

Note. It differs from all species of the section *Ixeridopsis* Bab. by roundish or roundish-ovate leaves that are reticulate beneath, exhibiting some affinity with *C. nana* Richardson.

32. *C. lactea* Lipsch. in Fedde, Repert. XLII (1937) 159; Bab. in

Univ. Calif. Publ. Bot. 22 (1947) 538 (The Genus *Crepis*, 2).—*C. pygmaea* auct. p. min. p., non L.: B. Fedtsch. Rast. Turk. (1915) 765.—*Youngia pygmaea* var. *purpurea* Winkl. ex O. Fedtsch. in Tr. Peterb. Bot Sada, XXI, 3 (1903) 369 (Fl. Pamira) and Rast. Pamira, collected in 1091 by B.A. and O.A. Fedtchenko (1904) 47; O. and B. Fedtsch. Perech. Rast. Turk. IV, 350.—*Y. purpurea* Lipsch. op. cit. (1937) pro syn.—**lc.**: Babc. op. cit. fig. 153.

Perennial. Plant entirely glabrous, glaucescent. Root extended above into woody, branched, more or less thick rhizome bearing numerous brown, scaly, remnants of dead leaves and vegetative buds, producing latex on injury. Stems few, 5–10 cm high, slender, sometimes prostrate, flexuous, cylindrical, longitudinally striped, solid, branched from the middle, less often almost from the base, with slender divaricate branches, leafy. Leaves thick, indistinctly reticulate, abruptly narrowed into petiole, lamina elliptical, oblong-obovate, obtuse or subacute, with irregular remote small teeth or entire; basal and lower cauline leaves 2.5–6.0(7.5) cm long (including petiole) and 0.5–1.3 cm wide, with slender petiole longer, equal to or less often slightly shorter than lamina; upper cauline leaves small, short petiolate. Capitula with 10–12 florets; on very slender, mostly slightly curved 0.5–1.5(2.0) cm long peduncles, aggregated in lax corymbose-inflorescence. Involucre cylindrical-campanulate, 8–10 mm long and 3–4 mm wide (at flowering time); involucre bracts crisped-hairy along margin; outer bracts four or five, of unequal length, ovate- or oblong-lanceolate, acute, without scarious border and one-sixth to one-fifth as long as inner; inner bracts eight, of equal length, linear-oblong, subacute with white
659 scarious border often pink above, (innermost) weakly keeled, without subterminal corniculate process outside or with dark green, weakly developed, tubercular thickening; glabrous on the inner surface. Receptacle faveolate, glabrous. Florets pinkish-purple, one and one-half times as long as Involucre. Corolla 11–14 mm long; ligules to 2.5 mm wide; Corolla 11–14 mm long; ligules to 2.5 mm wide; corolla tube 3.0–4.5 mm long, glabrous. Style branches yellow. Achenes all alike, yellowish, 5.5–6.0 mm long and about 0.6 mm wide, fusiform, very slightly narrowed above, slightly broadened at apex, with 10 longitudinal stripes or weakly prominent ribs, smooth; pappus 5.0–5.5 mm long, white, persistent. Flowering July to August. (Plate XXXI, Fig. 3).

Stony talus and slopes; alpine mountain zone.— *Soviet Central Asia*: Pamiro-Alai (Pamir). *General distribution*: Dzhungaria-Kashgaria (Kashgaria-Tagdumbash River valley). Described from Lake Kara-Kul. Type in Moscow; its duplicates in Leningrad and Berkeley in California.

Note. *C. lactea* Lipsch. stands out distinctly among the rest of the species of the section *Ixeridopsis* Babc. Its leaves resemble somewhat those of *C. nana* Richardson, but in all other characters it sharply differs

from the latter. Babcock's contention (l. c.) that this Pamir species occupies an intermediate position between *C. nana* Richardson and *C. naniformis* Babc. can hardly be considered correct.

33. **C. nana** Richardson in Bot. App. Franklin, 1 Journ. ed. 1 (1823) 764 (28 in repr.), ed. 2 (1823) 757 (29 in repr.); Kryl. Fl. Zap. Sib. XI. 3043, p. p.; Karavaev, Konsp. Fl. Yakut. 179; Popov, Fl. Sredn. Sib. II, 779.—*C. humilis* Fisch, ex Herd. in Bull. Soc. Nat. Mosc. XLIII, 2 (1870) 190, non Gaudin (1829).—*C. nana* ssp. *typica* Babc. in Univ. Calif. Publ. Bot. 22 (1947). 540, p. max. p. (The Genus *Crepis*, 2).—*C. nana* var. *compacta* Kryl. Fl. Alt. III (1940) 763 and Fl. Zap. Sib. XI, 3044.—*Prenanthes pygmaea* Ldb. in Mém. Acad. Sc. Pétersb. Ser. V, V (1815) 553, non *Crepis pygmaea* L.—*P. polymorpha* Ldb. α . *pygmaea* (Ldb.) a. *integrifolia* Ldb. and b. *lyrata* Ldb. Fl. alt. IV (1833) 145.—*P. polymorpha* Ldb. β . *flaccida* Ldb. ibid. (1833) 145.—*Barkhausia nana* (Richardson) DC. Prodr. VII, 1 (1838) 156; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 17 (Fl. baic.-dahur.).—*B. nana* b. *lyratifolia* Turcz. in DC. op.cit. (1838) 156.—*Youngia pygmaea* (Ldb.) Ldb. α . *nana* (Richardson) Ldb. β . *flaccida* (Ldb.) Ldb. and δ . *lyrata* (Ldb.) Ldb. Fl. Ross. II. 2 (1846) 838.—*Hieracioides nanum* (Richardson) O. Ktze. Rev. Gen. I (1891) 346, "*Hieracioides*"—**Ic.**: Gmel. Fl. sibirica II, T. VII, fig. 2, 3; Babc. op. cit. fig. 154.

660 Perennial. Plant entirely glabrous, glaucescent. Root long, slender, vertical, extended above into short, vertical, simple or short and sparsely branched, 2–5 mm thick rhizome. Stems few or solitary, 3–7(10) cm high, rather thick, more or less flattened, solid, branched almost from the base, densely leafy in lower part, sometimes extremely shortened and appearing pulvinate, comprising rosettes of basal and lower cauline leaves with short, slender, axillary peduncles terminating in solitary capitulum. All leaves abruptly narrowed into very slender petiole (two and one-half three to five times as long as lamina, often violet; basal and lower cauline leaves numerous, 1.5–6.0(7.5) cm long (including petiole), lamina 0.6–2.0 (less often to 3.5) cm long and 0.4–1.3(1.7) cm wide, ovate-roundish, broadly elliptical, obovate, oblong-obovate or almost oblong, obtuse or subacute, sometimes some leaves acute, entire or with few teeth, less often lyrate lobate or lyrate pinnatifid, with one or two(three) lobes on each side; upper cauline leaves smaller and narrower, lanceolate or almost linear, acute or short acuminate, entire. Capitula with 9–11 florets, on very slender, mostly slightly curved, 0.3–2.0 cm long peduncles, aggregated in compact compound corymb. Involucre cylindrical, 9–10(11) mm long and (1.5)2.0–3.0 mm wide; outer involucre bracts four to six, of unequal length, oblong-lanceolate, acute, without scarious border, one-sixth to one-fourth (one-third) as long as inner; inner bracts eight, of

equal length, linearly oblong, subacute, with white scarious border (innermost), keeled at the base and thickened at fruiting, without subterminal corniculate process outside, short cristate hairy on the upper margin, glabrous on the inner surface. Receptacle foveolate, glabrous, Florets yellow, slightly longer than involucre. Corolla 7.0–8.5 (10.0) mm long; ligules to 1.5 mm wide; corolla tube 3.5–4.(5.0) mm long, glabrous. Style branches yellow. Achenes all alike, yellowish-reddish-brown or reddish-brown, 4.5–6.5 mm long, and 0.5–0.6 mm wide, fusiform, scarcely narrowed at both ends or attenuate above into short (about 1 mm long), beak-like projection, slightly broadened at the apex, with 10–13 rounded scabrous (with high magnification!) ribs; pappus 6–7 mm long, white, persistent, but readily shedding on touch. Flowering July to August.

Gravel-beds along river and stream banks, stony and rubbly talus and slopes, moraine deposits near glaciers; in alpine mountain zone.—*Arctic*: Arctic Siberia, Chukotka, Anadyr; *Western Siberia*: Alatau (Kurai Range, Chuya and Katun alpine summits, headwaters of the Bukhtarma River, vicinity of village of Ordynka); *Eastern Siberia*: Yenisei (Khatanga and Medvezhya rivers), Angara-Sayans, Yakutia (in southwest up to southern Mui Range and Rytnyi Cape on coast of Lake Baikal); *Far East*: Okhotsk; ? *Soviet Central Asia*: Dzhungaria-Tarbagatai (mountains southeast of Lake Zaisan). *General distribution*: Mongolia (mountains near western coast of Lake Kosogol, Mongolian Altai), Dzhungaria-Kashgaria (Dzhungaria—Mustau Mountains in Tarbagatai), North America. Described from Canada. Type in London (in Kew).

Note. In my narrower interpretation, *C. nana* Richardson is comparatively uniform over the entire stretch of the Asiatic part of its distribution area. As a rule, the leaves in this species are entire or with
661 fewer teeth. On Wrangel Island and in the area of the Chaun Inlet, a form is found with lyrate lobes or lyrate pinnatifid leaves. I am not sure about its taxonomic significance, since, in the Altai, in the area of Lake Kosogol and occasionally in other parts of Western Siberia, one comes across specimens similar to the Chukotka plant.

In view of the absence of material, relating to *C. nana* Richardson from North America in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad, I am unable to judge Babcock's subspecies *C. nana* ssp. *ramosa* Babc. (l. c.).

Section 8. Intybellioides Froel. in DC. Prodr. VII, 1 (1838) 164, p. p.—*Intybus* Fries, Nov. Fl. Suec. ed. 2 (1828) 244, p. p.—*Intybellia* Monn. Ess. monogr. Hierac. (1829) 78, p. p. on Cass. (1821).—*Geracium* Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1345, 1367, p. p. and Fl. germ. excurs. I (1830) 259, p. p.—*Crepis* sect. *Crepis* Ćl. Koch, Synops. ed. 2,

2 (1844) 502, p. p.—*Crepis* sect. *Intybus* (Fries) Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 247, 284, p. p.—*Crepis* sect. *Intybellia* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515, p. p.: Bab. in Univ. Calif. Publ. Bot. 22 (1947) 213 (The Genus *Crepis*, 2)—*Crepis* sect. *Eucrepis* §3. *Praemorsae* Boiss. Fl. or. III (1875) 831, p. min. p. —*Crepis* sect. *Eucrepis* auct. non DC.: O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. min. p.—*Crepis* Schmalh. Fl. II (1897) 152, p. min. p.—Perennial, rhizomatous, pubescent plant; caudex leafy, one-stemmed. Stem erect, hard or slender, 15–70 (less often to 90) cm high, short branched at the apex, leafless, only with very small bracteiform leaves in fork of inflorescence. Less often bearing one strongly reduced, linear, cauline leaf in the middle. All leaves basal, oblong-obovate or oblong-oblancheolate, sometimes partly oblanceolate, with indistinct small teeth, weakly sinuate-toothed, less often entire, short-petiolate. Capitula medium, with many-florets (25–30 florets), aggregated in paniculate or racemose-paniculate inflorescence. Outer involucre bracts half to one-third as long as inner; inner bracts glabrous on the inner surface, keeled on the outside at fruiting, very slightly thickened at base. Receptacle glabrous; corolla 1–15 mm long, with 3–4 mm long tube, densely pubescent with rather long, thin hairs. Achenes all like, reddish-brown, 3.5–6.0 mm long, fusiform, slightly narrowed at both ends, without beak, with 20 longitudinal ribs; pappus white, 4.5–6.0 mm long.

Type (lectotype) of section; *C. incarnata* (Wulf.) Tausch.

34. ***C. praemorsa*** (L.) Tausch in Flora, XI, 1 (1828) 79; Froel. in DC. Prodr. VII, 1, 164, p. p.: Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 111 (Fl. Baic.-Dahur.); Ldb. Fl. Ross. II, 2, 825, p. p.; Schmalh. Fl. II, 152, p. p.; Syreistsch. III, Fl. Mosc. Gub. III, 336; Fedtsch. and Fler. Fl. Evrop. Ross. 1062, p. p.; O. and B. Fedtsch. Perech. Rast. Turk. 662 IV, 345; Hegi, III. Fl. 2, 1157; Kraschem. in Fl. Yugo-Vost. VI, 474; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 550, p. p. (the Genus *Crepis*, 2); Kryl. Fl. Zap. Sib. XI, 3033; Klovov. in Vizn. Rosl. URSR, 595; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 746; Majewski, Fl. ed. 8, 634; Dostal, Klič. (1958) 636; Karavaev, Kosp. Fl. Yakut. 178; Popov, Fl. Sredn. Sib. II, 783.—*C. fistulosa* Fisch. ex Ldb. op. cit. (1846) pro syn.—*C. racemosa* Car. and St. Lag. and *C. racemiformis* Car. and St.-Lag. Fl. Moy. Rhone et Loire (1889) 499.—*Hieracium praemorsum* L. Sp. pl. (1753) 801, non All.—*H. spicatum* Gilib. Fl. Lithuan. III (1781) 238, n. v. and Exerc. phytol. I (1792) 191.—*H. lactucaceum* Schrank ex Froel. in DC. op. cit. (1838) pro syn.—*Intybus praemorsus* (L.) Fries. Nov. Fl. Suec. ed. 2 (1828) 245.—*Geracium praemorsum* (L.) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1367.—*Intybellia praemorsa* (L.) Monn. Ess. monogr. Hierac. (1829) 79.—*Soyeria praemorsa* (L.) Mutel. Fl. Fr. II

(1835) 224.—*Aracium praemorsum* (L.) D. Dietr. Syos. pl. IV (1847) 1329.—*Hieracioides praemorsum* (L.) Rupr. Fl. Ingr. I (1860) 629; O. Ktze. Rev. gen. I (1891) 346, "*Hieracioides*".—**lc.**: Gmel. Fl. sibirica, II (1749) t. XIII, fig. 2; Syreistsch. op. cit. 337; Fedtsch. and Fler. op. cit. Fig. 1076; Hegi, op. cit. Fig. 835; Javorka and Csapody, Iconogr. Fl. Hung. 564, fig. 4048; Dostal, op. cit. t. 222, fig. 2170; Babc. op. cit. fig. 159. **Exs.**: GRF No. 823; Herb. Fl. Ingr. No. 361; Eston. pl. No. 181; Woloszczak, Fl. polon. ex. No. 747; Samuelsson, Pl. Suec. exs. No. 1617 (sub *C. paludosa*); Fl. Gall. et Germ. exs. cent. 2, No. 33; Sch. Bip. Cichoriaceotheca, No. 50; Billor, Fl. Gall. et Germ. exs. No. 143; Rchb. Fl. Germ. exh. No. 1439; Callier, Fl. siles. exs. Nos. 216 and 217; Petrak, Fl. Boehm. et Morav. ex. Lfg. VIII, No. 795.

Perennial. Rhizome short, oblique, with numerous slender roots. Stem solitary, 15–70 (less often to 90) cm high, rather thick or slender, straight, sulcate, short branched below apex, leafless, less often bearing single, highly reduced, linear, cauline leaf almost in the middle. Leaves pubescent with more or less dense or scattered, very short, whitish, eglandular, divergent, somewhat crisped, slightly stiff, sometimes in inflorescence relatively stiff hairs, less often subglabrous and smooth. All leaves basal, 5–20(25) cm long (including petiole) and 1.5–6.0 cm wide, thin, oblongly-obovate, oblongly-elliptical or oblong-oblancheolate, less often somewhat oblanceolate (and then acute or cuspidate), obtuse or subobtuse, with indistinct small teeth or weakly sinuate-toothed, with occasional obtuse teeth, less often entire, narrowed in short-winged petiole. Capitula in racemose, often racemose-paniculate inflorescence, on slender, short, often grayish, woolly-hairy peduncles. Involucre short-cylindrical, 8–12 mm long and (3.0)3.5–5.0 mm wide (at beginning of flowering); involucre bracts pubescent on the outside with remote, often (outer) more or less dense, 663 pale, eglandular, somewhat stiff hairs or glabrous (particularly inner), dark or pale green, glabrous on the inner surface; outer involucre bracts 8–12, imbricate; appressed, of unequal length, linearly lanceolate, mostly subacute, shallow-ciliate incised, without scarious border, half to one-third as long as inner; inner bracts 13–15, of equal length, linear-lanceolate, subacute or acute, entire, with narrow, white scarious border (innermost), white hairy along upper margin, narrow, keeled outside at fruiting, very slightly thickened and hardened at the base. Receptacle pitted, glabrous. Florets light yellow, one and one-half times as long as involucre. Corolla 10–13(14) mm long; ligule to 2 mm wide; corolla tube 3.5–4.0 mm long, densely pubescent with long, entangled, hyaline and thin hairs. Style branches yellow. Achenes all alike, reddish-brown, 3.5–4.0 mm long and 0.5 mm wide, terete, fusiform, almost uniformly slightly narrowed at both ends, straight or slightly curved, with roughly 20 narrow, rounded ribs reaching achene apex and bearing very fine (visible at high

magnification!), erect, conical hairs; pappus 4.5–5.0(5.5) mm long, white, pappus hairs thin, readily shedding singly. Chromosomes $2n = 8$. Flowering second half of May to June.

Forest meadows, glades, and edges; scrubs, open deciduous forests, pine forests, less often in meadow steppes.—*European Part*: Dvina-Pechora (south), Baltic Region, Ladoga-Ilmen, Upper Dnieper, on Upper Volga, Volga-Kama, Middle Dnieper, Volga-Don, Trans-Volga; *Western Siberia*: Upper Tobol, Ob' Region (south), Irtysh (northern part), Altai; *Eastern Siberia*: Yenisei (south), Angara-Sayans, Dauria (far west), Lena-Kolyma (southwestern part, Lena River valley). *General distribution*: central Europe, Scandinavia (southern part), Mongolia (northern part). Described from Europe. Type in London.

35. *C. caucasigena* Czer. in Addenda XXVIII, 758.—*C. praemorsa* auct. fl. Cauc. non Tausch.

Perennial. Rhizome short, oblique, with numerous slender roots. Stem solitary, 40–70 cm high, rather thick or somewhat slender, straight, ribbed-sulcate, hollow, short branched above, leafless, less often bearing one strongly reduced, linear, cauline leaf above the middle, including leaves pubescent from relatively dense or scattered (mostly leaves) very short, whitish, eglandular, erect, slightly bent or somewhat crisped, mostly somewhat stiff hairs, short glandular hairy in inflorescence. All leaves basal, 6–20(25) cm long (including petiole) and 1.5–4.0 cm wide, thin, oblong-obovate, often oblong-oblancheolate or almost oblong, less often partly oblancheolate (and then acute or short-acuminate), mostly obtuse at the apex with indistinct small teeth or weakly sinuate-toothed with remote obtuse teeth, sometimes entire, narrowed into short-winged petiole. Capitula in racemose or racemose-paniculate inflorescence, on slender, short peduncles covered with rather numerous, very small, usually reddish-brown, glandular, stiff hairs mixed with woolly hairs. Involucre short-cylindrical, (9)10–12 mm long and 3.5–5.0(6.0) mm wide (at beginning of flowering); involucre bracts sparsely short glandular hairy on the outside, dark green, glabrous on the inner surface; outer involucre bracts 8–10, imbricate, appressed, of unequal length, oblong-lanceolate, usually subobtusely, shallow ciliate incised, without scarious border, one-third as long as inner; inner bracts 11–13, of equal length, linear-lanceolate, subacute or acute, entire, with narrow white border (innermost), white hairy on the upper margin, narrow keeled outside at fruiting, very slightly thickened and hardened at the base. Receptacle pitted, glabrous. Florets light yellow, one and one-half time as long as involucre. Corolla 12–15 mm long; ligule to 2.5 mm wide; Corolla tube 3–4 mm long, densely pubescent from rather long, entangled, hyaline, thin hairs. Style branches yellow. Achenes all alike, reddish-brown, 5–6 mm long and 0.5–0.7 mm

wide, almost terete, fusiform, almost uniformly slightly narrowed at both ends, straight or slightly curved, usually with 20 narrow, rounded, almost smooth ribs reaching the achene apex; pappus 5.5–6.0 mm long, white. Flowering June to July. (Plate XXXII, Fig. 1).

Subalpine meadows and pine forests in upper mountain zone.—*Caucasus*: Ciscaucasia (central Caucasus, mostly), Dagestan (Gamra-Duz, between settlements of Akusha and Muti). Endemic. Described from Balkaria (left bank of Rtsyvashka River, village of Mamai-Kyunnyum). Type in Leningrad.

Note. It is clearly distinguished from *C. praemorsa* (L.) Tausch by short, glandular-hairy peduncles and involucre bracts, larger, almost smooth achenes, a longer pappus, and an isolated range.

Section 9. Mesophyllion Bab. in Univ. Calif. Publ. Bot. 22 (1947) 213 (The Genus *Crepis*, 2).—*Crepis* b. *Crepis* Rchb. Fl. Germ. excurs. I (1830) 257, p. min. p. descr. and in Moessl. Handb. ed. 2, II, 2 (1829) 1397, p. min. p. nomen.—*Crepis* sect. *Eucrepis* DC. Prodr. VII, 1 (1838) 161, p. min. p.; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 514, p. min. p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. min. p.—*Crepis* sect. *Hieraciodes* Froel. in DC. op.cit. (1838) 161, p. min. p. *Crepis* sect. *Crepis* §1. Koch, Synops. ed. 2, 2 (1844) 502, p. min. p.—*Crepis* sect. *Alethocrepis* Bisch Beitr. Fl. Deutschl. Schweiz (1851) 247, 266, p. min. p.—*Crepis* subgen. *Melanachaenium* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 279, 311.—*Berinia* subgen. *Melanoberinia* Sch. Bip. ibid. (1866) 316, p. min. p.—*Crepis* sect. *Eucrepis* §5. *Malacophyllae* Boiss. Fl. or. III (1875) 832, p. min. p.—*Crepis* subgen. *Crepis* Schmalh. Fl. II (1897) 152, p. min. p.—Perennial, biennial or annual, pubescent. Root virgate, slender, vertical. Stem solitary, less often more or less numerous, erect or ascending, slender or rather thick, 5–90 cm high, branched, sometimes simple, leafy. Basal and lower cauline leaves lanceolate-linear and lanceolate to oblong-ob lanceolate, with remote small teeth, sinuate-toothed or pinnatifid, short-petiolate; upper, sometimes middle, cauline leaves linear, entire; almost all cauline leaves sessile, sagittately amplexicaul or not; apical leaves very small, bracteiform. Capitula small or more or less large, with many florets, aggregated in corymbose or paniculate-corymbose inflorescence; outer involucre bracts half to one-third as long as inner, linear; inner bracts appressed-hairy on the inner surface, less often (sometimes in *C. bungei* Ldb.) glabrous; receptacle foveolate or tuberculate-ciliolate. Corolla 7–20 mm long, with 2–6 mm long tube, pubescent with fewer, very short hairs or glabrous. Achenes all alike, dark or dark reddish-brown, 3–6 mm long and 0.4–0.5 mm wide, fusiform, terete, mostly strongly narrowed above or attenuated into very short (0.5–0.7 mm long) beak-like projection, with 10(12) spiny

and short hairy, less often scabrous, longitudinal ribs; pappus white, 4–8 mm long, persistent.

Type of section: *C. bungei* Ldb.

36. *C. bungei* Ldb. in DC. Prodr. VII, 1 (1838) 164; Ldb. Fl. Ross. II, 2, 827; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 109 (Fl. baic.-dahur.); Kryl. Fl. Alt. III, 759 and Fl. Zap. Sib. XI, 3038; Babč. in Viv. Calif. Publ. Bot. 22 (1947) 564 (The Geus *Crepis*, 2); Karavaev, Konsp. Fl. Yukut. 178, p. p.; Popov, Fl. Sredn. Sib. III, 780.—*C. bungeana* C.A.M. ex DC. op. cit. (1838) 164, pro syn.—*C. salicifolia* Froel. in DC. ibid. (1838) 169.—*C. bungei* Y. *elongata* Ldb. Fl. Ross. II, 2 (1846) 827.—*C. irtutensis* Babč. in Univ. Calif. Pub. Bot. 19 (1941) 401 and 22 (1947) 560.—*Hieracium strictum* Ldb. Fl. alt. IV (1833) 132; DC. op. cit. 238, non *Crepis stricta* Scop. (1772).—*H. uliginosum* Turcz. in Bull. Soc. Nat. at. Mosc. XI (1838) 96, nomen (Cat. baic. No. 723), XXI, 3 (1848) 110, pro syn.—*Berinia stricta* (Ldb.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 317.—*Hieracioides strictum* (Ldb.) O. Ktze. Rev. gen. I (1891) 345, "*Hieracioides*".—*Ic.*: Gmel. Fl. sibirica, II, t. XIII, fig. 1; Ldb. Ic. pl. Fl. Ross. IV, t. 380; Babč. op. cit. (1947) fig. 163, 164 and pl. 12.

Perennial. Root vertical, slender, almost not branched, extended above into vertical, simple, 0.3–1.0 cm long, caudex covered with dark brown remnants of dead leaves. Stem solitary, (10)15–35(45) cm high, erect, somewhat thick, ribbed-sulcate, hollow, branched in the upper part, sometimes almost from the middle with upward spreading branches, less often simple, leafy, green in the lower part, less often entirely violet, including leaves weakly appressed arachnoid-hairy or subglabrous, usually peduncles mostly sparsely short glandular hairy in the upper part or scabrous from fine, blackish or whitish or whitish bristles or spines. Basal 666 leaves 2–8(10) cm long (including petioles) and 0.7–1.5(2.0) cm wide, oblong-elliptical, oblong-ob lanceolate or lanceolate, obtuse to acute, with remote small teeth, irregularly sinuate-toothed, less often pinnatilobate, gradually narrowed into short, narrowly winged petiole or sessile; lower and middle cauline leaves similar to basal, sessile, not amplexicaul, or lanceolate-linear, acuminate, as also linear upper cauline, entire; apical leaves very small, bracteiform. Capitula with many florets, on somewhat thick, straight or slightly curved, 2–11 cm long peduncles distinctly thickened below capitula, aggregated in lax, simple, corymbose inflorescence, fewer (usually two to seven per stem), rarely solitary. Involucre campanulate, 10–12(14) mm long and 5–7(9) mm wide (at beginning of flowering); involucre bracts covered with dense, long, glandular, blackish or pink, scabrous hairs along midrib on the outer side, often (mostly outer) weakly appressed, arachnoid-hairy; outer bracts five to eight, lanceolate-linear, acute, remote, of unequal length, without

scarious border, almost half as long as inner; bracts 12–16, oblong-lanceolate, subobtusate, of equal length, with wide scarious border (innermost), glabrous on the inner surface or sparsely appressed hairy, deflexed at fruiting, indistinctly keeled. Receptacle foveolate, walls of pits sparsely ciliate above. Florets yellow, two times as long as involucre. Corolla (12)14–20 mm long; ligules to 3 mm wide; corolla tube 4–6 mm long, glabrous. Style branches yellow. Achenes all alike, dark reddish-reddish-brown, 4–5 mm long and 0.5–0.6 mm wide, fusiform, terete, very slightly narrowed at both ends, with 10–12 narrow, rounded, somewhat scabrous (under high magnification!) ribs; pappus 7.0–8.0(8.5) mm long, white, persistent. Chromosomes $2n = 8$. Flowering July to August.

Meadows, open coniferous (pine, spruce and larch) forests, glades and forest edges, in willow thickets, gravel-beds and moist places along riverbanks and lake shores.— *Western Siberia*: Altai; *Eastern Siberia*: Angara-Synas (southern part), Dauria, Lena-Kolyma. *General distribution*: Mongolia (northern part). Described from Altai (Chuya River, from collections of A.A. Bunge. Type in Leningrad; duplicates of type in Leningrad and Geneva.

Note. Babcock (l. c.) described *C. ircutensis* Babc. from a specimen collected by V.L. Komarov in the Eastern Sayans in the upper reaches of the Irkuta and Oka rivers. In his opinion, it is similar to *C. bungei* Ldb., differing from it by the taller, sparsely branched stem, smaller number of florets in the capitulum, longer anther appendage, and certain other characters. An examination of the voluminous material of *C. bungei* Ldb. showed that this species varies in roughly the same range over the entire stretch of its distribution area without segregating into distinct geographic races. There are no grounds whatsoever to separate plants from the Eastern
667 Sayans into a different species. In his monograph of the genus *Crepis* L., Babcock cites, besides the type specimen of *C. ircutensis* Babc., two specimens from the Altai collections of Gebler. One of them is preserved in the herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad. An examination of this specimen, an illustration the type specimen of *C. ircutensis* Babc. and the herbarium specimens of *C. bungei* Ldb. led me to the conclusion that the smaller, not commonly found form of *C. bungei* Ldb. without any definite distribution area was described under the first of these two names.

The taxonomic significance of the form from the Altai (Chuya River), from the collection of A.A. Bunge, described under the name *Hieracium strictum* β . *lanatum* Ldb. *Fl. alt.* IV (1833) 132 (= *Crepis bungei* β . *lanata* (Ldb.) Ldb. *Fl. Ross.* II, 2 (1846) 827), remains unclear to me and nobody has recollected it. The significant and, in essence, only difference from the typical form lies in that its cauline leaves are densely villous from entangled glandular hairs.

Contrary to M.G. Popov (l. c.), I did not find any transitions between *C. bungei* Ldb. and *C. crocea* (Lam.) Babc. (= *C. pallasii* Turcz.) and hence cannot agree with his hypothesis that both of these species, like *C. polytricha* (Ldb.) Turcz., are hybrids (hybridogenic species) of *Youngia tenuifolia* (Willd.) Babc. and Stebbins (= *Crepis tenuifolia* Willd.) × *Crepis chrysanthia* (Ldb.) Turcz.

37. *C. tectorum* L. Sp. pl. (1753) 807; M.B. Fl. taur.-cauc. II. 258; DC. Prodr. VII, 1, 162; Ldb. Fl. Ross. II, 2, 822, excl. Syn. *C. lodomeriensis* Bess.; Turcz. in Bull. Soc. Nat. Mosc. XXI, 3 (1848) 108 (Fl. baic.-dahur.); Boiss. Fl. or. III. 847 p. p.; Schmalh. Fl. II, 153, p. p.; Syreitsch. III. Fl. Mosk. Gub. III, 338; Fedtsch. and Fler. Fl. Evrop. Ross. 1061, p. p.; O. and B. Fedtsch. Perech. Rast. Turk. IV, 344; Hegi, III. Fl. VI, 2, 1165; Kom. and Alis. Opred. Rast. Dalnevost. Kraya II, 1101; Grossh. Fl. Kavk. IV (1934) 261 and Opred. Rast. Kavk. 518; Kraschen. in Fl. Yugo-Vost. VI, 474, p. p. excl. ssp. *astrachanica*; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 566, p. p. (The Genus *Crepis*, 2) Stank. and Tal. Opred. Vyssh. Rast. Ed. 1, 698, p. p.; Kryl. Fl. Zap. Sib. XI, 3031; Klovov in Vozn. Rosl. URSR, 595, p. p.; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 745; Majewski, Fl. ed. 8, 634; Geideman, Opred. Rast. Mold. SSR, 304, p. p.; Karavaev, Kونس. Fl. Yukut. 178; Dostal, Klič. (1958) 636; Popov, Fl. Sredn. Sib. II, 782; Mikhailovskaya in Fl. BSSR, V, 198; Ramenskaya, Opred. Vyssh. Rast. Karelii, 432.—*C. polymorpha* Gilib. Fl. Lithuan. III (1781) 231, n. v. and Exerc. phytol. I (1792) 186, non Wallr. (1822).—?*C. dioscoridis* auct. non L.; Pall. Reise II (1773) 523; Georgi, Beischr. Russ. Reuchs. III, 5 (1800) 1215, nomen.—*Hieracium tectorum* (L.) Krasch. Fl. Westf. (1853) 331.—*Hieracioides tectorum* (L.) O. Ktze. Rev. gen. I (1891) 346, p. p. "*Hieracioides*".—**Ис.**: Syreitsch. op. cit. 338; Hegi. op. cit. Fig. 843 and Taf. 278, Fig. 2 (color.) Javorka and Csapody, Iconogr. Fl. Hung. 563, fig. 4042; Babc. op. cit. fig. 165.—**Exs.**: GRF No. 622; Herb. Fl. Ingr. No. 359; Woloszczak, Fl. polon. exs. No. 452; Pl. Finl. exs. Nos. 1000, 1412; Fl. exs. reip. Bohem.—
668 Slov. No. 987; Sch. Bip. Cichoriaceotheca, suppl. No. 123; Fl. Gall. et Germ. exs. No. 410; Pl. Suec. exs. Nos. 1614, 1615.

Annual or biennial. Root vertical, strongly branched. Stem mostly solitary, (7)12–90 cm high, erect, rather thick or slender, ribbed-sulcate or longitudinally striped, hollow, branched at the apex or from the middle, less often almost from the base, leafy, green, sometimes violet in the lower part, entirely weakly appressed, arachnoid-short-hairy, in addition often scabrous in the upper part from fine, pale or blackish, remote spines or sparsely glandular and short hairy, smooth in the lower part, and sometimes subglabrous, often villous-grayish tomentose below capitula. Basal and lower cauline leaves 2–15(20) cm long (including petiole) and

to 2(4) cm wide, lanceolate-linear, lanceolate, oblanceolate; less often basal leaves oblong-oblanceolate (and then obtuse), acute, with remote small teeth, sinuate-toothed, pinnatilobate, less often pinnatipartite or lyrate pinnatisect with lanceolate or linear, acute distant lobes, gradually narrowed into very short winged petiole, slightly arcachnoid-hairy or glabrous, early withering; middle cauline leaves as also basal and lower cauline ones, sessile, usually amplexicaul with small acute auricles at the base, often as also upper cauline leaves, linear, entire; upper cauline leaves with revolute margin, often scabrous from spinules; sometimes all leaves linear, entire, Capitula with many florets, on slender, mostly slightly curved, to 7 cm long peduncles, scarcely thickened below capitula, aggregated in paniculate-corymbose or corymbose inflorescence. Involucre cylindrical-campanulate, or narrow-campanulate, 7–9(10) mm long and 3–5(6) mm wide (at the beginning of flowering), pale green or green; involucre bracts appressed and finely grayish acachnoid-hairy on outer side, covered with more or less scattered, less often somewhat dense (mostly in lower part of involucre bracts), short glandular, mostly pale hairs, sometimes mixed with fewer long, eglandular hairs, pale greenish, less often blackish setaceous hairs; outer involucre bracts (6)8–10, linear, acute, distant, of unequal length, without scarious border, one-third to half as long as inner; inner bracts 12–16, oblong-lanceolate, acuminate, of equal length, with wide scarious border (innermost), rather dense appressed hairy on the inside, deflexed at fruiting, thickened at the base. Receptacle foveolate, walls of pits ciliate above. Florets yellow, one and one-half times as long as involucre; corolla 10–13 mm long, ligule to 2.5 mm wide; corolla tube 2.5–3.75 mm long, pubescent, with very short acicular hairs. Style branches dark green. Achenes all alike, dark or blackish-reddish-reddish-brown, (3.0)3.5–6.0 mm long and 0.4–0.5 mm wide, fusiform, terete, strongly narrowed above or attenuated into very short beak-like projection, with 10 narrow, rounded ribs covered with very fine (under high magnification!), erect, spiny hairs; pappus 4–6 mm long, white, persistent. Chromosomes $2n = 8$. Flowering June to August (September).

Fields, fallows, roadsides and dwellings, crop fields and orchards, and in other weedy places, meadows, along riverbanks.—*European Part*: all regions (very rare in the far south); *Western and Eastern Siberia*: All regions (in north roughly up to Severnaya Sosva-Vilyui River basin-Magadan line); *Far East*: all regions; *Soviet Central Asia*: Balkhash Region (Zaisan depression, Ayague River). *General distribution*: Almost whole of Europe, Dzhungaria-Kashgaria (northeastern part of Dzungaria), Mongolia (northern part), China (northeastern part). Described from western Europe (apparently from southern Sweden). Type in London.

Note. This species varies greatly in respect of the form and cutting of the leaves, the height and branching of the stem, and the number of

capitula, which has led to the recognition of a whole series of varieties that in my opinion do not have great systematic significance.

For the territory of the USSR, the following varieties have been described: 1) var. *tectorum* (= var. *vulgaris* E. Mey. ex Bisch. *Beitr. Fl. Deutschl. Schweiz.* (1851) 273)—basal and lower cauline leaves lanceolate, runcinate; middle cauline leaves deeply sinuate-toothed; upper cauline leaves linear, entire, often sagittate at base; stem paniculately branched above, many-headed; 2) var. *segetalis* Roth (*Bot. Abhandl.* (1787) 37 and *Tentam. Fl. Germ.* II, 2 (1793) 254)—lower leaves lanceolate, sinuate-toothed, upper linear, entire, with weakly developed auricles at base or without auricle; stem paniculately or corymbosely weakly branched above, with fewer heads; 3) var. *gracilis* Wallr. (*Sched. Crit.* (1822) 430)—all leaves entire, often without auricles at base; stem very slender, one to four (six)-headed; 4) var. *elata* Ldb. (*Fl. Ross.* II, 2 (1846) 823)—plants in all parts robust; cauline leaves lanceolate, sagittate at base; stem strongly paniculately branched; 5) var. *melanocephala* Ldb. (*Ibid.*)—lowermost leaves pinnatifid, cauline leaves toothed, auriculate at base; involucre blackish setaceous hairy. The last of these varieties is the most intriguing. It was described from Crimea, where *C. tectorum* L. s., str., in reality is absent.

Along the southern boundary of the range in the European part of the USSR, quite often one comes across a form in which the involucral bracts are covered with remote bristles—short, eglandular, pale—on the outer side along the midrib, and based on this character, it tends toward *C. ramosissima* Urv.

38. *C. ramosissima* Urv. in *Mém. Soc. Linn. Paris*, I (1822) 102 (*Enum. pl. Archip.*); Spreng. *Syst. veg.* III, 634; DC. *Prodr.* VII, 1, 162; Ldb. *Fl. Ross.* II, 2, 822.—*C. tectorum* auct. p. p. non L.: Schmalh. *Fl. II* (1897) 153; Fedtsch. and Fler. *Fl. Evrop. Ross.* 1061; Stank. and Tal. *Opred. Vyssh. Rast. ed. 1*, 698; Klovov in *Vizn. Rosl. URSS*, 595;

670 Geideman, *Opred. Rast. Mold. SSR*. 304.—*Hieracioides ramosissimum* (Urv.) O. Ktze. *Rev. gen. I* (1891) 346, "*Hieraciodes*".

Annual or biennial. Root vertical, branched. Stem solitary, (9)20–50(70) cm high, erect, somewhat thick or slender, ribbed-sulcate, hollow, strongly branched mostly from the middle or base, leafy, green, violet in lower part with leaves sharply scabrous from short eglandular, pale bristles or spines and usually scatteredly appressed arachnoid-hairy smooth only in lowermost part. Basal leaves (1)2–7(10) cm long (including petiole) ad 0.4–1.5 cm wide, lanceolate, oblanceolate, oblong-oblanceolate, less often oblong-obovate, acute, to obtuse, with remote small teeth, irregularly sinuate-toothed, lyrate or pinnatifid, gradually narrowed into very short, winged petiole, often subglabrous or glabrous; cauline leaves linear or

lanceolate-linear (lower cauline), short-acuminate to acute, entire or (lower and middle cauline) sinuate-toothed, lyrate pinnatilobate, less often lyrate pinnatipartite, with fewer, linear, acute, distant lobes, sessile, usually amplexicaul, with small or rather long, linear auricles at the base; middle and upper cauline with revolute margin. Capitula many-flowered, on slender, mostly slightly curved, 1–7 cm long peduncles scarcely thickened below capitula, aggregated in irregular lax corymbose inflorescence. Involucre cylindrical-campanulate, 7–8 mm long and 3–5 mm wide, pale green; involucre bracts weakly appressed grayish arachnoid-hairy on the outside, with one row of somewhat long, eglandular, slightly yellowish, stiff, setaceous hairs along midrib; outer involucre bracts five to eight, linear, acute, distant, of unequal length, without scarious border (innermost), sparsely appressed hairy on the inner surface, at fruiting deflexed, keeled and thickened at base. Receptacle indistinctly alveolate, ciliolate. Florets yellow, one and one-half times as long as involucre. Corolla 9–10.5 mm long; ligules to 1.5 mm wide; corolla tube about 2.5 mm long, pubescent with fewer very small spiny hairs. Style branches dark green. Achenes all alike, dark reddish-reddish-brown, 3.0–4.5 mm long and 0.4–0.5 mm wide, fusiform, terete, strongly narrowed above or attenuated into very short (about 0.5 mm long) beak-like projection, with 10 narrow, rounded, ribs covered with very fine (under high magnification!), erect, spiny hairs; pappus 5 mm long, white, persistent, but more readily detaching on touch. Flowering second half of May to June (July).

Steppes, sands, sometimes weedy places.—*European Part*: Bessarabia (south), Black Sea Region (southern part), Lower Don (Rostov Region, Krasnoarmeisk—former Sarepta—possibly introduced), Crimea
 671 (northern part). *General distribution*: Balkans (Dobrudzha). Described from Berezan Island facing mouth of Dniester River. Type in Paris.

Note. M.V. Klovov drew my attention to this entirely undeservedly forgotten, good, littoral-steppe species. It differs from *C. tectorum* L. s. str. by having the leaves and stem sharply scabrous from short eglandular, pale bristles or spines; the stem strongly branched from the middle or base; the involucre bracts covered with somewhat long, eglandular, slightly yellowish, stiff, setaceous hairs on the outer side along the midrib, and the ligules of the corolla narrower in the middle. Moreover, *C. tectorum* L. s. str. is a weed, while *C. ramosissima* Urv. as a rule, grows in natural habitats.

39. *C. astrachanica* Stev. in schedis, descr. latina nostra in Addenda XXVIII, 759; Stank. and Tal. Opred. Vyssh. Rast. ed. 1 (1949) 699, descr. rossica.—*C. tectorum* auct. p. min. p. non. L.: Schmalh. Fl. II (1897) 153; Fedtsch. and Fler. Fl. Evrop. Ross. 1061.—*C. tectorum*

ssp. *astrachanica* Krasch. in Fl. Yugo-Vost. VI (1936) 474, descr. rossica.

Annual. Root vertical, branched. Stem more or less numerous, 5–15 (25) cm high, arcuately ascending, less often partly lodged, slender, ribbed-sulcate or longitudinally striped, hollow, branched from the middle or base, leafy, green, weakly appressed-hairy throughout, smooth, often with isolated spinules above. Leaves smooth, glabrous or highly scattered arachnoid-hairy; basal leaves in dense rosette, 2.5–7.0(10.0) cm long (including petiole), and 0.4–1.5(2.5) cm wide, lanceolate, oblanceolate or lanceolate-linear, acute or subacute, irregularly sinuate-toothed, pinnatilobate to lyrate pinnatifid, gradually narrowed into very short-winged petiole, not withering; cauline leaves linear, subacute, entire, sessile, usually without auricles or with weakly developed auricles at the base, with slightly revolute margin. Capitula with many florets, on slender, mostly slightly curved, 2–1 cm high peduncles, scarcely thickened below capitula, aggregated in irregular, lax corymbose inflorescence. Involucre narrow-campanulate, 6–7(8) mm long and 3–5 mm wide, pale green; involucre bracts weakly grayish arachnoid-hairy on the outside, sometimes additionally with one row of distant, short, eglandular, pale, stiff setaceous hairs along midrib; outer involucre bracts five to eight, linear, acute, distant of unequal length, without scarious border, half as long as inner; inner bracts 12–14, oblong-lanceolate, acuminate, of equal length, with wide scarious border (innermost), hairy on the inner surface appressed, deflexed at fruiting, slightly keeled, thickened at the base. Receptacle alveolate, ciliolate. Florets yellow, one and one-half times as long as involucre. Corolla 7–10 mm long; ligules to 1.5(2.0) mm wide; corolla tube 2–3 mm long, pubescent with fewer very fine spiny hairs. Style branches greenish or yellowish. Achenes all alike, dark reddish-reddish-brown, 3–5 mm long and 0.4–0.5 mm wide, fusiform, terete, usually much strongly narrowed above, with 10 narrow, rounded ribs covered with very fine (visible under high magnification!), erect, spiny hairs; pappus 4.0–4.5 mm long, white, persistent, but more readily detaching on touch. Flowering June to August (September).

Banks of rivers and freshwater lakes.—*European Part*: Lower Volga (village of Yenotaevka, city of Astrakhan and vicinity); *Caucasus*: Dagestan (vicinity of village of Gyurmish, Tabasaran District); Eastern Transcaucasia (Baku). Endemic. Described from Astrakhan. Type in Leningrad.

Note. This species differs from the very similar *C. tectorum* L. s. str. by more or less numerous, low, arcuately ascending, less often partly procumbent, slender stems branched from middle or base; cauline leaves that are without or with weakly developed auricles; capitula that are somewhat smaller; involucre bracts that are weakly grayish arachnoid-hairy on the outside, sometimes with distant, eglandular, setaceous

hairs along the midrib; shorter corolla; and greenish or yellowish style branches.

40. *C. nigrescens* Pohle in Tr. Bot. Sada Yurevsk. Univ. III, 4 (1902) 231; Fedtsch. and Fler. Fl. Evrop. Ross. 1063; Kryl. Fl. Zap. Sib. XI, 3031; Stank. and Tal. Opred. Vyssh. Rast. ed. 1, 699.—*C. tectorum* auct. p. p. non L.: Rupr. Symb. hist. et geogr. pl. Ross. (1846) 45.—*C. tectorum* var. *nigricans* Rupr. ibid. (1846) 147.

Annual or biennial. Root vertical, branched. Stem mostly solitary, 6–30 cm high, erect, somewhat thick, ribbed-sulcate, hollow, branched from the middle or base, leafy, green, sometimes violet in the lower part, weakly arachnoid-hairy throughout, often villous-grayish tomentose below capitula, additionally above with distant, less often below capitula rather dense long, bent, erect, eglandular blackish setaceous hairs or fine blackish acute spines, less often scatteredly long setaceous hairy all over (and then setaceous hairs pale in lower part. Leaves scatteredly arachnoid-hairy on both surfaces, sometimes subglabrous (mostly basal and lower cauline); upper cauline leaves often scabrous above or along margin from fine sharp spinules, with fewer long eglandular blackish, setaceous hairs along midrib beneath; basal and lowermost cauline leaves 2–7 cm long (including petiole) and 0.4–1.5(2) cm wide, oblong-ob lanceolate or lanceolate, obtuse to acute, with remote small teeth, irregularly sinuate-toothed or lyrate pinnatilobate, gradually narrowed into very short winged petiole, early withering; middle cauline leaves lanceolate or linear, subacute to short-acuminate, entire, often entire in the upper half, sinuate-toothed in the lower half, pinnatilobate or pinnatipartite, with linear, acute, distant lobes, sessile, usually slightly amplexicaul with small acute auricles; upper cauline leaves linear, entire with scarcely revolute margin. Capitula with many florets, on slender, mostly slightly curved, to 5(7) cm-long peduncles slightly thickened below capitula, aggregated in lax corymbose inflorescence. Involucre campanulate, 9–13 mm long and (4)5–7 mm wide (at flowering time), dark green; involucre bracts slightly appressed, grayish arachnoid-hairy on the outside, covered mostly with dense, long, more or less entangled, eglandular, blackish less often green, setaceous hairs; outer involucre bracts five to eight, linear, acute, distant, of unequal length, without scarious border, half to one-third as long as inner; inner bracts 12–13(14), oblong-lanceolate, acuminate, of equal length, with wide scarious border (innermost), sparsely appressed hairy on inner surface, deflexed at fruiting, thickened at the base. Receptacle tuberculate or indistinctly alveolate, ciliolate. Florets yellow, two times as long as involucre. Corolla (12)13–17 mm long, ligule up to 2.5(2.8) mm wide; corolla tube 2.5–4.0 mm long, sparsely pubescent with very short hairs. Style branches dark green or green. Achenes all alike, dark reddish-

reddish-brown, 5.0–5.5(6.0) mm long and about 0.5 mm wide, fusiform, terete, strongly narrowed above or attenuated into very short beak-like projection, with 10 narrow, rounded ribs, covered with very fine (visible under high magnification!), erect spiny hairs; pappus 5.5–7 mm long, white, persistent. Flowering July to August.

Sandy and sandy-stony banks of rivers and seacoast.—*Arctic*: Arctic Europe (in west up to Rybachi Peninsula of Kola Peninsula), Arctic Siberia (far western part, in east up to eastern coast of Ob' Inlet); *European Part*: Karelia-Lapland (eastern part of Kola Peninsula and Solovetsky Islands). Endemic. Described from Kanin Peninsula. Type in Leningrad.

Note. This is an arctic species, differing from *C. tectorum* L. s. str. by a different type of pubescence of the stem and involucre bracts, larger, dark green involucres, and longer corolla.

Section 10. *Phaeacasium* (Cass.) DC. Prodr. VII, 1 (1838) 160; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 214 (The Genus *Crepis*, 2).—*Phaeacasium* Cass. in Dict. Sc. nat. XXXIX (1826) 387; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515.—*Idianthes* Desv. Fl. Anj. (1827) 199.—*Sclerophyllum* Gaudin. Fl. Helv. V (1829) 47.—*Intybellia* Monn. Ess. monogr. Hierac. (1829) 78, p. p. non Cass. (1821).—*Crepis* a. *Phaeacasium* (Cass.) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1397 and Fl. germ. excurs. (1830) 257.—*Crepis* sect. *Crepis* § 1. Koch, Synops. ed. 2, 2 (1844) 502 p. min. p.—*Cymboseris* Boiss. Diagn. pl. or. ser. I, 11 (1849) 50.—*Crepis* sect. 674 *Alethocrepis* Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 247, 266, p. min. p.—*Crepis* sect. *Eucrepis* § 4. *Sclerophyllae* Boiss. Fl. or. III (1875) 832, p. p.—*Crepis* sect. *Cymboseris* (Boiss.) O. Hoffm. op. cit. (1894) 374.—*Crepis* subgen. *Crepis* Schmalh. Fl. II (1897) 152, p. min. p.—Annual pubescent plants; root virgate, vertical, slender, caudex narrow, leafy, mostly with solitary stem. Stem erect, more or less hard and slender (15)30–80(120) cm high, sparsely branched from the middle or base, leafy. Basal, and lower cauline leaves oblong-ob lanceolate, or oblanceolate, sinuate-toothed, pinnatilobate, less often pinnatipartite, petiolate; middle and upper cauline leaves oblong-elliptical to linear-lanceolate, sessile; apical leaves strongly reduced, linear, bracteiform. Capitula small, with relatively many florets (15–30 florets), aggregated in compound corymbs or corymbose-paniculate inflorescence. Outer involucre bracts one-seventh to one-fifth as long as inner; inner bracts glabrous on inner surface, strongly keeled on the outside at fruiting, with spongy thickening at the base, Receptacle glabrous. Corolla 8–10 mm long with 2–3 mm long tube, densely pubescent with long thin hairs. Achenes of two types: peripheral—yellowish or greenish, 4–6(7) mm long, fusiform, strongly narrowed toward apex, without beak, longitudinally striped, without



pappus; inner achenes similar to peripheral but smaller, 3.5–5.0 (6.0) mm long, with pappus, or all achenes alike; pappus white, 3.5–5.0 mm long.

Type of section: *C. pulchra* L.

41. **C. pulchra** L. Sp. pl. (1753) 806; M.B. Fl. taur.-cauc. II, 259; DC. Prodr. VII, 1, 160; Ldb. Fl. Ross. II, 2, 820; Boiss. Fl. or. III. 846; Schmalh. Fl. II, 153; Fedtsch. and Fler. Fl. Evrop. Ross. 1062; O. and B. Fedtsch. Perech. Rast. Turk. IV, 343; Hegi, Ill. Fl. VI, 2, 1178; Grossh. Fl. Kavk. IV (1934) 261 and Opred. Rast. Kavk. 518; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 661, p. p. excl. ssp. *africana* Bab. (The Genus *Crepis*, 2); Papava in Fl. Gruzii, VIII, 698; Dostal, Klič. (1958) 637; Nikitin in Fl. Turkm. VII, 350; Asker. in Fl. Azerb. VIII, 567.—*C. lapsanifolia* Rchb. Fl. germ. excurs. I (1830) 257.—*C. youngiformis* C. Koch. in Linnaea XVII (1843) 277.—*C. hispanica* Pau. Not. Bot. Fl. Hisp. I (1887) 11, II (1899) 30.—*C. cylindrica* St.-Lag. ex. Car. Etud. Fl. ex. 8, II (1889) 500.—*C. valentina* Willk. Suppl. Fl. Hisp. (1893) 116.—*Crepis biennis* auct. non L.: Rgl. ex O. Fedtsch. in Izv. Obshch. Lyub. Estestv. Antr. i Etnogr. 103 (1902) 96.—*C. pulcherrima* Grossh. in Tr. Tifl. Bot. Sada, Nov. Ser. 1 (1920) 45; Grossh. Fl. Kavk. IV (1934) 261 and Opred. Rast. Kavk. 518; Papava, op. cit. 699, non Fisch. ex Link (1822). —*C. carinata* Bab. op. cit. (1947) 668, pro syn.—*Chondrilla pulchra* (L.) Lam. Fl. Fr. II (1778) 106.—*Lampsana pulchra* (L.) Vill. Hist. pl. Dauph. III (1789) 163.—*Prenanthes paniculata* Moench. Meth. (1794) 534.—*P. hieracifolia* Willd. Sp. pl. III, 3 (1803) 1541.—*P. pulchra* (L.) DC. in Lam. and DC. Fl. Fr. ed. 3, IV (1805) 7.—*P. viscosa* Baumg. Enum. stirp. Transsilv. III (1816) 44.—*Phaegasium lampsanoides* Cass. in Dict. Sc. nat. XXXIX (1826) 387.—*P. pulchrum* (L.) Rchb. f. Ic. Fl. Germ. XIX (1859) 39; F. Schultz in Jahresbericht Pollichia XX–XXI (1863) 173; Nevski in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4 (1937) 295; Kovalevskaya in Fl. Uzb. VI (1962) 502.—*Idianthes pulchra* (L.) Desv. Fl. Anj. (1827) 199.—*Sclerophyllum pulchrum* (L.) Gaudin, Fl. Helv. V (1829) 48.—*Intybellia pulchra* (L.) Monn. Ess. monogr. Hierac. (1829) 79.—*Youngia kochiana* Ldb. op. cit. (1846) 837.—*Hieracioides pulchrum* (L.) O. Ktze. Rev. gen. I (1891) 346, "*Hieracioides*".—*Launaea pulchra* (L.) Pavl. Fl. Tsent. Kazakhst. III (1938) 360.—**lc.**: Rchb. Ic. Fl. Germ. XIX, t. 1431; Hegi, op. cit. Fig. 853; Javorka and Csapody, Iconogr. Fl. Hung. 536, fig. 4045; Bab. op. cit. fig. 204, 205, 207; Dostal. op. cit. t. 223, fig. 2178; Nikitin, op. cit. Plate LVII: Kovalevskaya, op. cit. Plate LI, Fig. 1.—**Exs.**: Fl. exs. austro-hung. No. 3412; Domin and Krajina Fl. Cechosl. exs. No. 91; Fl. Etrusca exs. sine numero; H.F.A.M. No. 200; Kotschy, Pl. Pers. austr. Nos. 255 and 691; Sint. It. or. 1888, No. 940 ; It. or. 1892, No. 4390; It. trans-casp.-pers. 1900–1901, No. 1818; Bornm. It. pers. turc. 1892–1893 No. 4141.

Annual. Root woody, vertical. Stem solitary (less often several) (15) 30–80 (120) cm high, mostly thick or slender, straight, sometimes slightly flexuous, ribbed-sulcate or longitudinally striped, hollow, sparsely branched from the middle, upper part or from the base, leafy, in the lower part pubescent with dense, short, pale, erect, glandular, very rarely eglandular and then with longer whitish and crisped hairs, entirely glabrous above, smooth. Basal and lower cauline leaves 3–16(24) cm long (including petiole) and (0.7)1.0–4.0 cm wide, oblong-ob lanceolate or oblanceolate, usually obtuse or subacute, irregularly sinuate-toothed, shallow pinnatilobate with deltoid teeth or lobes, less often runcinate or subentire, narrowed into narrow-winged petiole; middle cauline leaves oblong-elliptical to linear-lanceolate, subacute, acute or acuminate, boldly sinuate-toothed to entire, sessile, semiamplexicaul, with more or less truncate, cordate or sagittate bases, apical leaves strongly reduced, linear, bracteiform; all leaves pubescent on both surfaces with sparser than on stem, short, glandular, less often eglandular and longer hairs; apical leaves glabrous. Capitula in compound corymbose or corymbose-paniculate inflorescence, on slender peduncles. Involucre short, cylindrical, 8–11(13) mm long and 3–4 mm wide (at the beginning of flowering). Involucral bracts glabrous on both surfaces, pale green; outer bracts five to seven, of equal length, ovate, acute, with wide scarious border, one-fifth to one-seventh as long as inner; inner bracts 10–14, of equal length, linear-lanceolate, subacute, with white scarious border (innermost), hairy along upper margin, strongly keeled outside at fruiting, with spongy thickening and hardened at the base, deflexed. Receptacle glabrous. Florets yellow, one and one-half times as long as involucre. Corolla 8–10 mm long; ligules 1.0–2.5 mm wide; corolla tube 2–3 mm long, densely pubescent with long flexuous, hyaline, thin hairs. Style branches dark green. Achenes of two types: peripheral yellowish or greenish, 4–6(7) mm long and 0.4–0.5 mm wide, more or less compressed, strongly narrowed toward apex, slightly curved, longitudinally striped, smooth, without pappus; inner achenes yellowish, shorter than peripheral, 3.5–5.0(6.0) mm long and 0.4–0.5 mm wide, terete, usually somewhat strongly narrowed toward the apex, slightly curved, longitudinally striped, with pappus, outermost of them sometimes greenish with slightly prominent ribs bearing very fine (under high magnification!), spreading white spiny hairs, others smooth, or all achenes alike, similar to earlier described inner achenes; pappus 3.5–5.0 mm long, white; pappus hairs very thin, soft, usually persistent. Flowering April to June.

Stony and loamy turfey slopes, forest glades, and rubbly taluses, among shrubs, along riverbanks, near irrigation channels, in gardens, fields and weedy places, lowlands to middle mountain zone, to 2,100 m.—*European Part*: Crimea (south); *Caucasus*: Ciscaucasia, Dagestan, Eastern

Transcaucasia, Western Transcaucasia (in Novorossik—Tuapse area), Southern Transcaucasia (southern Armenia and Nakhichevan ASSR), Talysh; *Soviet Central Asia*: mountainous Turkmenia (Kopetdag), Karakum (Krasnovodsk, introduced), Pamiro-Alai, Syr-Darya, Tien Shan (western part), Dzhungaria-Tarbagatai (Dzhungarian Alatau Range). *General distribution*: southern Europe, central Europe (south), northern Africa (Morocco), Balkans-Asia Minor, Syria, Armenia and Kurdistan, Iran and Afghanistan. Described from France. Type in London.

Section 11. Microcephalum Bab. in Univ. Calif. Publ. Bot. 22 (1947) 215 (The Genus *Crepis*, 2).—*Crepis* sect. *Intybellioides* Froel. in DC. Prodr. VII, 1 (1838) 164, min. p. p. —*Crepis* sect. *Intybellia* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 515, p. min. p.—Perennial pubescent plant. Rhizome short, vertical, obtuse, with slender roots. Stem solitary, few or rather numerous, erect or ascending, slender to more or less thick, (5)10–40 cm high, branched in the upper part or from the middle, leafless, less often with one or two(three) small, linear cauline leaves. Basal leaves numerous, oblanceolate, oblong- or ovate-oblanceolate, lyrate pinnatifid to sinuate-toothed and with remote small teeth, sometimes subentire, petiolate; cauline leaves absent or one or two(three), small, linear. Capitula small, with many florets, 2–15 and more per stem. Outer involucre bracts one-sixth to half as long as inner; inner glabrous on inner surface. Receptacle foveolate, glabrous. Corolla 6–15 mm long, with 2.5–5.5 mm long tube, pubescent in the upper part or short acicular, or rather long flexuous hairy. Achenes all alike, pale reddish-brown, 3.5–5.0 mm long and about 0.4 mm wide, fusiform, slightly narrowed at both ends, without beak, with 10–12 longitudinal ribs, pappus white, 4–6 mm long.

Type of section: *C. gmelinii* (L.) Tausch.

42. *C. gmelinii* (L.) Tausch in Flora XI (1828) 78; Froel. in DC. prodr. VII, 1, 164; Ldb. Fl. Ross. II, 2, 824, p. p.: Bab. in Univ. Calif. Publ. Bot. 22 (1947) 723 (The Genus, *Crepis*, 2); Tolmatchev and Rebristaya in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 411.—*C. multicaulis* β . *ochotensis* DC. op. cit. (1838) 165.—*C. multicaulis* auct. non. Ldb.: Kom. Vved. Izuch. Rast. Yakut. (1926) 164; Karavaev, Konsp. Fl. Yakut. 179.—*Hieracium gmelini* L. Sp. pl. (1753) 802.—*Aracium gmelinii* (L.) D. Dietr. Synops. pl. IV (1847) 1329.—*Hieracioides gmelini* (L.) O. Ktze. Rev. gen. I (1891) 346, "*Hieraciodes*".— *Ic.*: Gmel. Fl. Sibirica II, t. VIII, fig. 2; Bab. op. cit. fig. 230 and pl. 19; Tolmatchev and Rebristaya, op. cit. Fig. 3 (range map), 4, and 5b.

Perennial. Rhizome short, slender, vertical, obtuse below with slender roots. Stems one or two(three), 13–30 cm high, straight or slightly arcuate,

rather slender, longitudinally striped, hollow, branched above, leafless or with one or two(three) very small linear leaves, green sometimes lilac in the lower part, pubescent with short glandular hairs, scattered in the lower part, more dense above, in addition weakly arachnoid pubescent throughout, mostly whitish near capitula, villous-tomentose, sometimes glandular hairs absent below. Leaves scatteredly short glandular hairy on both surfaces, often mixed with fewer arachnoid hairs or subglabrous, usually with strong lilac tinge beneath; basal leaves numerous, 2.5–7.0 cm long (including petiole) and 0.5–1.5 cm wide, oblanceolate or elliptically oblanceolate, acute, some obtuse, sinuate-toothed, less often with remote small teeth, more or less cuneate, narrowed into very slender petiole as long as lamina or slightly longer. Capitula two to six, less often to 10 per stem, on erect or upward-spreading, somewhat slender peduncles, scarcely thickened below capitula, aggregated in corymbs; involucre narrow-campanulate, 9–11 mm long, 4–5 mm wide (at flowering time); involucre bracts linear-lanceolate, acute, covered with denser, short and long, blackish glandular hairs on the outside, weakly arachnoid below; outer involucre bracts five to eight, of unequal length, without scarious border, half to one-third as long as inner; inner bracts 12–13, of equal length, with narrow scarious border, glabrous on inner surface. Receptacle 679 foveolate, glabrous. Florets yellow, one and one-half to two times as long as involucre. Corolla 13–15 mm long, ligule 1.2 mm wide; corolla tube 5.0–5.5 mm long, pubescent in the upper part with short acicular hairs. Style branches yellow. Achenes all alike, pale reddish-brown, about 5 mm long and 0.4 mm wide, fusiform, somewhat strongly narrowed toward apex, straight, with 12 narrow, rounded, indistinctly tuberculate (under high magnification!) ribs; pappus 5–6 mm long, white, persistent. Flowering July to August.

Gravel-beds along riverbanks, rubbly slopes, among scrub; subalpine, less often alpine zone.—*Eastern Siberia*: Lena-Kolyma (mountains of northeastern part of Yakutian ASSR and Aldano-Okhotsk watershed). Endemic. Described from Siberia. Type in London.

Note. Babcock (op. cit.) considers this species similar to *C. tibetica* Babc. and *C. elongata* Babc. and not to *C. multicaulis* Ldb. *C. himalaica* Kitamura (in *Acta Phytotax. et Geobot.* XV, 4 (1954) 106)), described from Nepal, is related to *C. tibetica* Babc.

43. *C. multicaulis* Ldb. Ic. pl. Fl. Ross. I (1829) 9; Fl. alt. IV (1833) 125 and Fl. Ross. II, 2, 824; Froel. in DC. Prodr. VII, 1, 165, p. p. excl. β . *ochotensis* DC.; Kryl. Fl. Alt. III, 755 and Fl. Zap. Sib. XI, 3032; O. and B. Fedtsch. Perech. Rast. Turk. IV, 345; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 726 (The Genus *Crepis*, 2); Popov, Fl. Sredn. Sib. II, 783; Nikitin in Fl. Turkm. VII, 354; Tolmatchev and Rebristaya in Bot.

Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 402–413; Kovalevskaya in Fl. Uzb. VI, 493.—*C. multicaulis* var. *genuina* Rgl. in Bull. Soc. Nat. Mosc. XXXII (1859) 216.—*C. multicaulis* var. *laxa* Rgl. and var. *congesta* Rgl. in Bull. Soc. Nat. Mosc. XL, 3 (1867) 178.—*C. multicaulis* ssp. *genuina* (Rgl.) Babc. in Univ. Calif. Publ. Bot. 19 (1941) 401 and 22 (1947) 726.—*C. multicaulis* ssp. *congesta* (Rgl.) Babc. op. cit. (1941) 401 and (1947) 728.—*C. multicaulis* ssp. *subintegrifolia* Tolm. and Rebr. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XXI (1961) 405.—*Aracium multicaule* (Ldb.) D. Dietr. Synops. pl. IV (1847) 1329.—*Intybus multicaulis* (Ldb.) Th. Fries in Cat. sem. hort. Upsal. (1855) n. v. and in Bot. Notis. (1857) 181; Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 313.—*Hieracioides multicaule* (Ldb.) O. Ktze. Rev. gen. I (1891) 346, “*Hieracioides*”.—**lc.**: Ldb. Ic. pl. Fl. Ross. I, t. 36; Babc. op. cit. (1947) fig. 232, 233 and pl. 21, 22; Tolmatchev and Rebristaya, op. cit. Figs. 1, 2, 3 (range), 5, a, b.—**Exs.**: Kar. and Kir. Fl. Songor. No. 1687.

Perennial. Rhizome short, vertical, obtuse below, with numerous slender roots. Stems few or rather numerous, much less often solitary, (5) 10–40 cm high, straight or arcuately ascending, more or less thick to slender, longitudinally striped, hollow, branched toward the apex, in the upper part or from the middle, leafless, less often with one or two very small, linear leaves, green, sometimes, lilac in lower part, inflorescence as also involucre bracts pubescent with short, scattered or more or less dense, black or greenish, glandular or eglandular, but then longer and stiffer hairs, often whitish villous-tomentose near capitula, glabrous or
680 scatteredly arachnoid-hairy in the lower part less often entirely short glandular-hairy. Leaves pubescent on both surfaces with short, whitish eglandular hairs and subglabrous, less often glandular hairy; basal leaves numerous, 2–12(15) cm long (including petiole) and 0.5–3.0 cm wide, mostly oblong- or ovate-oblongate, obtuse, subobtusate or partly acute or lyrate pinnatifid to sinuate-toothed and with remote small teeth, sometimes subentire, gradually narrowed into slender petiole, as long as or slightly longer than lamina. Capitula 2–15 and more per stem, on arcuate or straight, slender peduncles not thickened below capitula, often clustered at apices of stems and branches, aggregated in paniculate-corymbose or corymbose inflorescence. Involucre cylindrical, 7–9(10) mm long and 2.5–3.0(4.0) mm wide (at flowering time); outer involucre bracts four to six, ovate- or oblong-lanceolate, acute, of unequal length, without scarious border, one-fourth to one-sixth as long as inner; inner bracts 8–10, linear-lanceolate, acute or subobtusate, of equal length, with narrow scarious border, glabrous on the inner surface. Receptacle foveolate glabrous. Florets yellow, slightly longer than involucre. Corolla 6–7 mm long; ligule about 0.6 mm wide; corolla tube 2.5–3.0 mm long, densely pubescent in the upper part with rather long, flexuous, thin hairs. Style

branches yellow. Achenes all alike, pale reddish-brown, 3.5–4.0 mm long and about 0.4 mm wide, fusiform, slightly narrowed at both ends, straight or slightly curved, with 10–12 narrow, rounded ribs bearing very fine (under high magnification!), upward spreading, erect, spiny hairs; pappus 4.0–4.5 mm long, white, persistent but readily shedding on touch. Chromosome $2n = 10$. Flowering June to July.

Stony and rubbly slopes, talus and debris, rocks, gravel-beds along banks of mountain streams, meadows, spruce and larch forests; subalpine, alpine, less often upper forest zones of mountains, up to 4,000 m; in tundra zone on nonturfy slopes of gullies, in places along roadsides.—*Arctic*: Arctic Europe (Bolshezemelskaya tundra); *European Part*: Dvina-Pechora (Bolshezemelskaya tundra and Sotka River in Pinega District of Arkhangel Region); *Western Siberia*: Altai; *Eastern Siberia*: Yenisei (upper reaches of Amundakan River—a tributary of Lower Tunguska River), Angara-Sayans (Sayans—headwaters of Usa River, Petropavlovsk mine on Serlikha River, Tannu-Ola Range along Ak-Karasuka River); *Soviet Central Asia*: Dzhungaria-Tarabagatai, Tien Shan, Pamiro-Alai, mountainous Turkmenia (Kopetdag Range—Razarash, Chapandag). *General distribution*: Scandinavia (near Varanger-Fjord in Norway), Mongolia (northwestern part), Dzhungaria-Kashgaria (eastern Tien Shan), Indo-Himalayas (western Himalayas). Described from Altai (Chuya River valley). Type in Leningrad.

Note. This species shows considerable variation in the degree and nature of the pubescence of the plant, incision and shape of the leaves and shape of the inflorescence. Babcock (l. c.) considers plants with compact and lax inflorescences as separate subspecies. However, a study of the voluminous material of *C. multicaulis* Ldb. shows that the two types occur more or less uniformly over the entire distribution area of the species. At best, Babcock's subspecies could be considered as minor ecological forms.

Despite a certain stability of characters in the Bolshezemelsk plants, I have decided not to recognize them as a separate race.

Section 12. *Alethocrepis* Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 247, 266, p. p.—*Barkhausia* b. *Aegoseris* Rchb. Fl. germ. excurs. I (1830) 255, p. p. descr. and in Moessl. Handb. ed. 2, II, 2 (1829) 1406, p. p. nomen.—*Crepis* b. *Crepis* Rchb. op. cit. (1830) 257, p. p. descr. and (1829) 1397, p. p. nomen.—*Barkhausia* sect. *Aegoseris* (Rechb.) DC. Prodr. VII, 1 (1838) 154, p. min. p.—*Crepis* sect. *Eucrepis* DC. op. cit. (1838) 161, p. p.; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 514, p. p.; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374, p. p.—*Crepis* subgen. *Chlorocrepis* Sch. Bip. in Webb and Berthelot Hist. nat. Canar. III, 2, 2 (1842–1850) 455 (Phytogr. Canar.) and in Jahresbericht Pollichia XXII–

XXIV (1866) 311. —*Crepis* sect. *Crepis* §1. Koch, Synop. ed. 2, 2 (1844) 502, p. p.—*Crepis* subgen. *Aegoseris* (Rchb.) Sch. Bip. op. cit. (1866) 312, p. min. p.—*Crepis* sect. *Eucrepis* §5. *Malacophyllae* Boiss. Fl. or. III (1875) 832, p. p.—*Crepis* sect. *Barkhausia* auct. p. min. p. non Gaudin: Boiss. op. cit. (1875) 832.—*Crepis* subgen. *Crepis* Schmalh. Fl. II (1897) 152, p. min. p.—*Crepis* sect. *Phytodesia* Babc. in Univ. Calif. Publ. Bot. 22 (1947) 215 (The Genus *Crepis*, 2).—Annual plants, pubescent. Root virgate, thin, vertical. Stem solitary (less often several, and then ascending), erect, slender or rather thick, 10–70(80) cm high, branched from middle or base, leafy. Basal and lower cauline leaves oblanceolate or oblong–oblanceolate, with remote small teeth and sinuate-toothed to lyrate-pinnatisect, petiolate; middle and upper cauline oblong and lanceolate to linear, entire, sinuate-toothed or pinnatipartite, sessile, sagittately amplexicaul, with acute or acuminate auricles; apical leaves very small, bracteiform. Capitula small, with many florets; aggregated in paniculate-corymbose or corymbose inflorescence. Outer involucre bracts one-third to half as long as inner, linear; inner bracts glabrous on the inner surface. Receptacle finely tuberculate or slightly alveolate, glabrous. Corolla 7–10 mm long, with 2–3.5 mm long tube; lower part of ligule pubescent with almost straight, more or less appressed, thin hairs. Achenes all alike, yellowish or reddish-brown, 1.5–2.5 mm long and 0.4–0.5 mm wide, cylindrical, scarcely narrowed at both ends, without beak, with 10 smooth, glabrous, ribs; pappus white, 3–4 mm long, readily shedding entirely.

Type (lectotype) of section: *C. nicaeensis* Balb.

- 682 44. **C. capillaris** (L.) Wallr. in Linnaea XIV (1840) 657; Babc. in Univ. Calif. Publ. Bot. 22 (1947) 769 (The Genus *Crepis*, 2); Stank. and Tal. Opred. Vyssh. Rast. ed. 1, 698; Klovov in Vozn. Rosl. URSR, 595; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 747; Pobedimova in Tr. Bot. Inst. Akad. Nauk SSSR, Ser. 3, 10 (1955) 323; Dostal, Klič (1958) 636; Mikhailovskaya in Fl. BSSR, V, 198; Ramenskaya, Opred. Vyssh. Rast. Karelii, 433.—*C. virens* L. Sp. pl. ed. 2 (1763) 1134; Ldb. Fl. Ross. II, 2, 821; Boiss. Fl. or. III, 848; Schmalh. Fl. II, 153; Fedtsch. and Fler. Fl. Evrop. Ross. 1062.—*C. parviflora* Moench. Meth. (1794) 535, non Desf. (1807).—*C. neglecta* auct. Fl. Ross. non L. —*C. pinnatifida* Willd. Sp. pl. III. 3 (1803) 1604, non Froel. (1838).—*C. agrestis* Waldst. and Kit. in Willd. ibid. (1803) 1602; Waldst. and Kit. descr. et icon. pl. rar. Hung. III (1812) 244; DC. Prodr. VII, 1, 163, p. max, p.; Ldb. op. cit. 822, p. min. p.—*C. diffusa* DC. Cat. hort. Monsp. (1813) 98 and in Lam. and DC. Fl. Fr. ed. 3, V (1815) 448.—*C. polymorpha* Wallr. Sched. crit. (1822) 426; DC. Prodr. VII, 1, 162, p. p.—*Lapsana capillaris* L. Sp. pl. (1753) 812.—*Hieracioides tectorum* (L.) O. Ktze. Rev. gen. I (1891) 346, p. p. "*Hieraciodes*".—**lc.**: Wadst. and Kit. op. cit. (1812) t. 220; Fedtsch.

and Fler. op. cit. Fig. 1875; Javorka and Csapody, Iconogr. Fl. Hung. 564, fig. 4047; Babč. op. cit. fig. 252 and pl. 24, 25; Dostal, op. cit. t. 222, fig. 2174.—**Exs.:** Sch. Bip. Cichoriaceothesca, suppl. No. 122; Petrak, Fl. Bohem. and Morav. exs. No. 576; Hayek, Fl. stir. exs. No. 294; P1. Suec. exs. Nos. 1612, 1613.

Annual. Root slender, vertical. Stem simple (less often several and then ascending), 20–70 cm high, erect, cylindrical, rather thick or slender, ribbed-sulcate or longitudinally striped, usually sparsely branched from the middle or lower, leafy, green, violet in lower part, pubescent with strongly scattered, eglandular, whitish, short, more or less appressed woolly or (below) somewhat long, flexuous, somewhat stiff hairs, villous, grayish-tomentose or grayish and finely arachnoid-hairy below capitula, and covered with fewer glandular, somewhat dark or pale, somewhat stiff hairs, less often entirely subglabrous. Leaves with distant long, eglandular hairs beneath along midrib or with isolated glandular, whitish, somewhat stiff hairs, or glabrous, less often scatteredly hairy on both surfaces. Basal and lower cauline leaves to 20 cm long (including petiole) and to 3.5 cm wide, oblanceolate or oblong-oblanceolate, acute to obtuse, sinuate-toothed, runcinately pinnatipartite or lyrate pinnatisect, with distant, narrow, acute lobes or segments, gradually narrowed into rather long, narrowly winged petiole, early withering (basal leaves); middle and upper cauline leaves lanceolate to linear, acuminate, pinnatipartite to entire, sessile, sagittately amplexicaul, with acute auricles; apical leaves very small, narrowly linear, bracteiform. Capitula with many florets, on very slender, usually slightly curved, 0.5–4.0 cm-long peduncles. Involucre cylindrical-campanulate, 5–7 mm long and 3.5–5.0 mm wide (at anthesis); involucre bracts weakly grayish-arachnoid-hairy on outer side, with one row of glandular, blackish, above reddish-brown, somewhat stiff, hairs along midrib; outer involucre bracts five to eight, linear, acute, of unequal length, without scarious border, half to one-third as long as inner; inner bracts 12–13(15), oblong-lanceolate, subacute, of equal length, with scarious border (innermost), glabrous on the inner surface, deflexed and thickened at base at fruiting. Receptacle barely tuberculate, glabrous. Florets yellow, one and one-half times as long as involucre. Corolla 7.5–9.0 mm long; ligule 2 mm wide; corolla tube 2.5–3.5 mm long, lower part of ligule pubescent with almost straight more or less appressed thin hairs. Style branches greenish or yellowish. Achenes all alike, yellowish or reddish brown, 2.0–2.5 mm long and 0.4–0.5 mm wide, terete, scarcely narrowed at both ends, with 10 rounded, narrow, smooth, glabrous ribs; pappus 3–4 mm long, white, readily detaching entirely. Chromosomes $2n = 6$. Flowering June to August.

Meadows, near scrubs, forest edges, herb slopes, roadsides, fields, gardens and parks.—*European Part:* Ladoga-Ilmen (Latvasyurya in Ladoga area of Karelia, near village of Shiltsovo in Luga District of

Leningrad Region, vicinity of settlement of Dedovich in Prokhov District of Pskov Region—introduced), Baltic Region (Lithuanian SSR, rarely; western part of Kaliningrad Region), Upper Dnieper (far southwestern part), Upper Dniester; *Caucasus*: Western Transcaucasia (Achishkho Mountain near Krasnaya Polyana, introduced). *General distribution*: central Europe, Atlantic Europe, Balkans (northern part), western Mediterranean (from Portugal to northern Italy), Scandinavia (southern part), North America (introduced). Described from Switzerland and Italy. Type apparently lost (according to the testimony of Babcock it is absent from the Linnaean Herbarium).

Note. Without exception, all specimens from Crimea and the Caucasus, until recently preserved in the Herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad under the name *C. agrestis* Waldst. and Kit., were found, after close study, to be none other than *C. micrantha* Czer. (= *C. parviflora* Desf.). Some of them are cited under the first of these names in the works of early authors (Bieberstein, De Candolle, Ledebour). I know of only one specimen of *C. capillaris* (L.) Wallr. from the Caucasus—from the Achishkho Mountains near Krasnaya Polyana, which was wrongly identified as *C. tectorum* L. The occurrence of *C. capillaris* (L.) Wallr. in Crimea, as also in other areas (Odeassa, Saratov and Rostov regions) of the European part of the USSR and the Caucasus not mentioned in the distribution of this species, has not yet been confirmed by more recent collections.

The European plants of this species show considerable variation. This is the basis for separating them into several species, not recognized in the recent monograph of the genus *Crepis* L. by Babcock, as well as
684 varieties and forms. However, in the USSR *C. capillaris* (L.) Wallr., judging from the scanty material at my disposal, is represented by a limited number of forms. The most common of them is the form described at the time under the name *C. agrestis* Waldst. and Kit.

C. nicaeensis Balb., close to *C. capillaris* (L.). Wallr. but differing from it by larger involucre, ciliate peduncles and larger achenes, is not found in the USSR, despite reports in literature.

45. ***C. micrantha*** Czer. nom. nov.—*C. parviflora* Desf. in Pers. Ench. II (1807) 376, descr.; Desf. Cat. pl. hort. Paris. ed. 3 (1829) 399, descr. and Table. de l'école de bot. mus. hist. nat. ed. I (1804) 88, nomen; DC. Prodr. VII, 1, 162; Ldb. Fl. Ross. II, 2, 822; Boiss. Fl. or. III, 849, Schmalh. Fl. III, 153; Fedtsch. and Fler. Fl. Evrop. Ross. 1062; Grossh. Fl. Kavk. IV (1934) 261 and Opred. Rast. Kavk. 518; Babc. in Univ. Calif. Pub. Bot. 22 (1947) 775, excl. syn. *Geracium parviflorum* Rchb. (The Genus *Crepis*, 2); Stank. and Tal. Opred. Vyssh. Rast. ed. 1, 698; Papava in Fl. Gruzii, VIII, 699; Nikitin in Fl. Turkm. VII, 356; Asker. in

Fl. Azerb. VIII, 567, non Moench (1794).—*C. muricata* Sibth. and Smith. Fl. Graec. Prodr. II (1813) 138 and Fl. Graec. IX, 4, non Gilib. (1781).—*C. breviflora* Delile ex Steud. Noemnc. bot. ed. 2, 1 (1840) 436, nomen.—*C. agrestis* auct. non Waldest. and Kit.: M.B. Fl. taur.-cauc. II (1808) 258, III (1819) 537; DC. op. cit. 163, p. min. p.; Ldb. op. cit. 882, p. max. p.—*Hieracioides tectorum* (L.). O. Ktze. Rev. gen. I (1891) 346, p. min. p. "*Hieracioides*".—**Ис.:** Sibth. and Smith. Fl. Graec. IX, t. 807; Bab. op. cit. fig. 253; Nikitin, op. cit. Plate LXI.—**Exs.:** Sintenis, It. trojanum, 1883, No. 933; Bornm. Lydiae et Cariae pl. exs. No. 9731.

Annual. Root slender, vertical. Stem mostly single, 10–60(80) cm high, erect, cylindrical, slender or rather thick, finely ribbed-sulcate or longitudinally striped, hollow, sparsely branched from the middle or base, leafy, green, sometimes, violet in the lower part, covered with scattered, less often relatively dense, eglandular, whitish, setaceous hairs in the lower part, less often entirely glabrous. Leaves with hairs similar to those on stem, along margin and midrib, often more or less scatteredly setaceous hairy on both surfaces (mostly basal and lower cauline leaves), sometimes glabrous; basal and lower cauline leaves 2.5–8.0(12.0) cm long (including petiole) and 0.7–2.5 cm wide, oblanceolate or oblong-oblanceolate, acute to subotuse, with remote small teeth, irregularly sinuate-toothed or runcinately divided with wide, triangular acute teeth and lobes, gradually narrowed into very short winged petiole, early-withering; middle and upper cauline leaves oblong to oblong-lanceolate, acute or acuminate, entire or irregularly sinuate-toothed, sessile, sagittately amplexicaul, with long acute
685 or acuminate auricles; apical leaves very small, bracteiform. Capitula with many florets, on very slender, usually slightly curved, glabrous or scarcely arachnoid-hairy, 0.5–2.0(2.5) cm-long peduncles, aggregated in many-headed, lax, paniculate-corymbose inflorescence. Involucre cylindrical-campanulate, 5–6 mm long and 2.5–3.0(4.0) mm wide (at flowering time); involucre bracts weakly grayish arachnoid-hairy with or without one row of rather long eglandular yellowish bristles along midrib; outer involucre bracts five, linear, acute, almost of equal length without scarious border, one-third as long as inner ones; inner bracts 8–10, linearly oblong, subacute, of equal length, with narrow scarious border (innermost), glabrous on inner surface, deflexed at fruiting, keeled, thickened at the base. Receptacle slightly alveolate, glabrous. Florets yellow, one and one-half times as long as involucre. Corolla 7–10 mm long; ligules to 2 mm wide; corolla tube 2–3 mm long, including lower part of ligules pubescent with almost straight, more or less appressed thin hairs. Style branches dark green. Achenes all alike, yellowish, 1.5–2.0 mm long and 0.4–0.5 mm wide, cylindrical, scarcely narrowed at ends, with 10 rounded, narrow, smooth glabrous ribs, pappus 3–4 mm long, white, readily shedding entirely. Chromosomes $2n = 9$. Flowering May to June (July).

Scrubs, thin forests, forest glades, dry herb slopes and weedy places, sometimes as weed in fields and crops; lowlands and foothills, less often in middle mountain zone.—*European part*: Crimea (south); *Caucasus*: Dagestan, Eastern Transcaucasia, Southern Transcaucasia (southeastern part), Talysh; *Soviet Central Asia*: Mountainous Turkmenia (Kaakhka). *General distribution*: Iran (northern part of Iran), Balkans-Asia Minor (in west up to islands of Aegean archipelago and southern Greece), eastern Mediterranean (Iraq, Syria, Palestine, United Arab Republic); introduced in southern France and Canary Islands. Described from the Orient. Type in Paris.

Note. The name *C. parviflora* Desf. must be rejected because it is a much later homonym of *C. parviflora* Moench, identified at present with *C. capillaris* (L.) Wallr.

In *C. micrantha* Czer. two varieties are distinguished:

1. var. *micrantha* (*C. parviflora* α . *trichocephala* C.A.M. in *Mém. Acad. Sc. Pétersb. ser. VI, Sc. Nat. VII* (1855) 11)—involucral bracts with one row of stiff bristles on outer side along the midrib;
2. var. *leiocephala* (C.A.M.) Czer. comb. nova (*C. parviflora* β . *leiocephala* C.A.M. op. cit. (1855) 11)—involucral bracts without bristles on outer side.

Both varieties occur in the Caucasus; the second variety is absent from the rest of the range of this species.

It must be noted that in the majority of Dagestan specimens of this species the leaves and the lower part of the stem are more densely setaceous-hairy.

Doubtful Species

C. foliosa Bab. in Univ. Calif. Publ. Bot. 23 (1951) 369, fig. 1 and Plate 46.

- 686 The species was described from the lone specimen collected by F. Teploukhoff on the Utka River near Krasnoufimsk on 24 July 1892 (Plantae Uralenses, No. 37). There is not a duplicate of the type specimen in the Herbarium of the Botanical Institute of the Academy of Sciences of the USSR in Leningrad. Babcock (l. c.) writes: "This station is within the geographic area of *C. tectorum*, but the plant shows more resemblance to *C. nicaeensis* in its involucre, flowers and, especially, its achenes. At the same time, it is very distinct from both of these species in its large upper cauline leaves with conspicuous auricles, its racemiform branching habit, and its indumentum (see Table 1) [the stem is sparsely tomentose throughout and, including, leaves, glandular-hairy-pubescent with pale fine hairs—S. Cz.]. Therefore, *C. foliosa* is classified in section 24 (*Phytodesia*), between *C. nicaeensis* and *C. capillaris*." I was unable to find anything

closer to it either in the Urals or in the other regions of the USSR. Below, I present the translation of the English (more complete) description of *C. foliosa* Bab.

“Annual, 2.3 dm. high, pubescent throughout with fine, short, pale gland-hairs; caudal leaves few, ephemeral (only remnants remaining on this specimen), oblanceolate or spatulate, long-petiolate; lowest cauline leaves (1–5 cm. from base) *ca.* 7 cm. long, oblanceolate, shortly petiolate, and auriculate, middle cauline leaves *ca.* 9 cm. long, 2 cm. wide near the base, lanceolate, acuminate, irregularly dentate and denticulate, sessile, amplexicaul, auriculate, the auricles about as long as the width of the blade, narrow, acuminate, upper cauline leaves similar to the middle ones, mostly *ca.* 5 cm. long; stem erect, terete, fistulose, sulcate tomentulous, remotely and regularly branched beginning near the base, branches 6–8 cm. long, arcuate, terminating in 2 or 3 heads on short peduncles subtended by leaves similar to the upper cauline leaves; aggregate inflorescence racemiform; peduncles 4–12 mm. long, tomentulous; heads erect, small, many-flowered; involucre campanulate, 7–8 mm. long, 4 mm. wide at base, tomentulous, densely pubescent with longer and shorter pale brown, gland-hairs; outer involucre bracts 6 or 7, subulate, 1/3 as long as the inner ones, acuminate, becoming lax; inner bracts 13–14, lanceolate, acute or acuminate, appressed-pubescent on inner face; corolla 11 mm. long; ligule 2 mm. wide, teeth 0.2–0.5 mm. long; corolla tube 3 mm. long, pubescent with short (up to 0.15 mm. long), 1- or 2-celled aciculate trichomes; anther tube 3.5–4 mm. long, 1 mm. wide when opened out, appendages 0.5 mm. long, lanceolate, acute, filaments 0.4 mm. longer; style branches 2 mm. long, 0.1 mm. wide, green; achenes (not fully mature) light brown, 2.75 mm. long, 0.5 mm. wide, moderately attenuate to both ends, with slightly expanded pappus disk and finely calloused hollow base, with light golden yellow base, 10-ribbed, the ribs rather prominent, 687 rounded, finely apiculate; pappus white, 4 mm. long, 1-seriate, the setae equally fine, soft, united at base. Flowering July–August, flowers yellow.”

Section 13. *Barkhausia* (Moench) Gaudin, Fl. Helv. V. (1829) 130, p. p.; “*Barckhausia*”; Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 246, 249, p. p.; Boiss. Fl. or. III (1875) 832, p. min. p. “*Barckhausia*”; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 373, p. p.—*Barkhausia* Moench, Meth. (1794) 537 and auct. al. europ. et ross. p. p. —*Wibelia* Gaertn. Mey. and Scherb. Fl. Wett. III, 1 (1801) 97, 144, non Pers. (1805).—*Hostia* Moench, Meth. Suppl. (1802) 221. —*Anisoderis* Cass. in Dict. sc. nat. XLVIII (1827) 429.—*Barkhausenia* Hoppe in Flora XII (1829) 512.—*Barkhausia* e. *Barkhausia* Rchb. and f. *Hostia* (Moench) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1410 and Fl. germ. excurs. I (1830) 256.—*Barkhausia* sect. *Lepidoseris* (Rchb.) DC. Prodr. VII, 1 (1838) 153, p.

min. p.—*Barkhausia* sect. *Anisoderis* (Cass.) DC. op. cit. (1838) 157, p. max. p.—*Crepis* sect. *Eucrepis* DC. op. cit. (1838) 161, p. min. p.—*Billotia* Sch. Bip. in Herb. and Winck. Jahrb. Pharmac. IV (1841) 155, in nota, non G. Don (1832).—*Crepis* subgen. *Wibelia* Sch. Bip. in Webb and Berthelot. Hist. nat. canar. III, 2, 2 (1842–1850) 456 (Photogr. canar.).—*Crepis* sect. *Barkhausia* §1. Koch, Synops. ed. 2, 2 (1844) 500.—*Anthochytrum* Rchb. f. Ic. Fl. Germ. XIX (1859) 39, t. 1432.—*Omalocline* C. *Dianthoseris* Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 321.—*Rhynchopappus* Dulac. Fl. Hautes-Pyr. (1867) 493, p. p.—*Crepis* sect. *Anthochrytrum* (Rchb. f.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 513.—*Crepis* sect. *Anisoderis* (Cass.) Benth. op. cit. (1873) 514; O. Hoffm. op. cit. (1894) 374, p. p.—*Crepis* subgen. *Barkhausia* (Moench) Schmalh. Fl. II (1897) 151, p. p.—*Crepis* sect. *Hostia* (Moench) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 214 (The Genus *Crepis*, 2).—Plants annual, less often biennial, pubescent. Root virgate, cordlike, vertical or oblique. Stem mostly solitary, usually erect, 5–60(80) cm high, branched, less often simple, leafy. basal and lower cauline leaves oblanceolate, oblong-oblanceolate, sometimes oblong-obovate, small-toothed to runcinately pinnatifid or subpinnatisect, short petiolate; middle and upper cauline ovate-lanceolate to oblong or linear-lanceolate, sessile, more or less amplexicaul; apical leaves strongly reduced, linear or bracteiform. Capitula medium or rather large, with many florets, mostly aggregated in lax corymbose inflorescence. Outer involucre bracts one-fourth to two-thirds as long as inner; inner bracts pubescent on the inner surface, less often glabrous, strongly keeled on the outside at fruiting, overlapping peripheral achenes, with spongy thickening in the lower part. Receptacle foveolate, ciliate-fimbriate, sometimes glabrous. Corolla 8–20 mm long, with 4–6(8) mm-long tube, pubescent with scattered, short acicular hairs or subglabrous. Achenes of two types; Peripheral—rather thick, yellow, greenish-yellowish or light reddish brown, 5–16 mm long, oblong or fusiform, laterally compressed, usually 688 curved, gradually narrowed into very short coarse beak or without beak; inner ones reddish-brown or deep reddish-brown, 9–18 mm long (with beak), fusiform, gradually narrowed into slender long beak, longitudinally striped or with 15–18 longitudinal ribs; pappus white or yellowish-white, (4.5)6.0–8.5 mm long, much longer than involucre.

Type (lectotype) of section: *C. alpina* L.

46. *C. alpina* L. Sp. pl. (1753) 806; M.B. Fl. taur.-cauc. II, 256; Boiss. Fl. or. III, 855; Schmalh. Fl. II, 152; Fedtsch. and Fler. Fl. Evrop. Ross. 1063; Grossh. Fl. Kavk. IV (1934) 260; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 678 (The Genus *Crepis*, 2).—*C. vesicaria* auct. non L.: Lam. Encycl. meth. II (1786) 179.—*Barkhausia scariosa* Moench, Meth.

(1794) 537.—*B. alpina* (L.) DC. in Lam. and DC. Fl. Fr. ed. 3, IV (1805) 41; DC. Prodr. VII, 1, 153; Lbd. Fl. Ross. II, 2 813; Grossh. Opred. Rast. Kavk. 518; Stank. and Tal. Opred. Vyssh. Rast. ed. 1, 697; Asker. in Fl. Azerb. VIII, 564.—*B. elata* C. Koch in Linnaea XXIII (1850) 684.—*Aracium alpinum* (L.) Monn. Ess. Monogr. Hierac. (1829) 71.—*Billotia alpina* (L.) Sch. Bip. in Herb. and Wink. Jahrb. Pharmac. IV (1840) 155, in nota.—*Anthochytum alpinum* (L.) Rchb. f. Ic. Fl. Germ. XIX (1859) 39.—*Hieracioides alpinum* (L.) O. Ktze. Rev. gen. I (1891) 345, "*Hieraciodes*".—**lc.**: Rchb. f. op. cit. t. 81; Babc. op. cit. fig. 213, pl. 6.—**Exs.**: Billot. Fl. Gall. et. Germ. exs. No. 3138.

Annual. Root vertical or oblique. Stem mostly solitary, (15)20–60(80) cm high, erect, ribbed-sulcate, solid, simple or sparsely branched above (less often from the base), with upward spreading branches, leafy, weakly short pubescent, sometimes entirely very finely whitish tomentose below capitula, scabrous in the upper part from thin spinules. Leaves green, weakly arachnoid hairy-short pubescent, with more or less occasional spinules or thin short bristles, mostly only along margin; basal and lower cauline leaves to 16 cm long and to 3.5–4.0 cm wide, oblong-obovate, or oblong-oblongeolate, obtuse, with small teeth or sinuate-toothed, gradually narrowed into short-winged petiole; middle cauline leaves ovately lanceolate, oblong or oblongly lanceolate, acute to subacuminate, usually with small sharp teeth, sessile, amplexicaul, with small acute auricles; apical leaves strongly reduced, linear-lanceolate. Capitula in lax simple corymbose inflorescence or solitary on plant, erect. Involucre at fruiting cylindrical-turbinate, bulged below, 16–20(25) mm long and 7–13(15) mm wide (in the widest part); outer involucral bracts 11–13, imbricate, 689 more or less of equal length, initially appressed, latter somewhat deflexed broadly-ovate or ovate-lanceolate, acute, entirely membranous, yellowish, half or one-third as long as inner, subglabrous or weakly arachnoid-hairy; inner bracts 13, of equal length, lanceolate, narrowed toward the apex, subobtuse, almost without scarious border, white tomentose on the outside, densely covered with short glandular hairs or long eglandular, yellowish, setaceous hairs, pubescent on the inner surface with very fine appressed hairs, thickened on the outside at fruiting, strongly obtusely keeled, with thin and ciliolate fimbria. Florets yellow, purple on outer surface of ligules. Corolla 12–16 mm long; corolla tube 4.5–5.5 mm long, pubescent with scattered, short, acicular hairs. Style branches greenish or green. Achenes of two types: peripheral—rather thick, (12)14–16 mm long (including beak) and 1.0–1.2 mm wide, gradually attenuate in coarse beak, curved, densely pubescent on the inner side with short, white, somewhat appressed woolly hairs, subglabrous on the outside, light reddish-brown, longitudinally striped; inner ones reddish brown, 15–18 mm long (including beak); body 7–8 mm long and 0.5–0.6 mm wide, fusiform, gradually attenuated into thin, pale, 8–10 mm, long beak, with 18 thin

ribs, densely covered with very fine (visible under high magnification!) reflexed spiny hairs, hairs also on beak; pappus 6–8 mm long, yellowish-white, persistent, much longer than involucre. Chromosomes $2n = 10$. Flowering (April) May to June.

Dry herb slopes, scrubs, forest glades, gravel-beds in valleys, sometimes as weed near fields and roadsides.—*European Part*: Crimea (south); *Caucasus*: Dagestan (vicinity of Derbent and Belidzha settlement), eastern Transcaucasia, Talysh. *General distribution*: Asia Minor, Syria (northern part). Described from cultivated specimen, grown in one of the botanical gardens in Italy. Type in London.

47. **C. foetida** L. Sp. pl. (1753) 807; Boiss. Fl. or. III, 851, p. p.; Fedtsch. and Fler. Fl. Evrop. Ross. 1063, p. min. p.—*C. foetida* a. *vulgaris* Bisch. Beitr. Fl. Deutschl. Schweiz (1891) 252.—*C. foetida* ssp. *eufoetida* Beger ex Domin in Preslia, 13–15 (1935) 252.—*C. foetida* ssp. *vulgaris* (Bisch.) Babč. in Journ. Bot. 76 (1938) 205 and in Univ. Calif. Publ. Bot. 22 (1947) 688 (The Genus *Crepis*, 2).—*C. foetida* ssp. *foetida*: Dostal, Klič (1958) 637.—*Picris foetida* (L.) Lam. Fl. Fr. II (1778) 108.—*Barkhausia foetida* (L.) F.W. Schmidt. Samml. Phys. Aufs. I (1795) 283; DC. in Lam. and DC. Fl. Fr. ed. 3, IV (1805) 42; DC. Prodr. VII, 1, 158; Ldb. Fl. Ross. II, 2, 820; Klovov in Vozn. Rosl. URSR, 594.—*B. graveolens* (Gaertn. Mey. and Scherb.) Link, Enum. Pl. hort. Berol. II, (1822) 290.—*B. candollei* Spreng. Syst. veg. 3 (1826) 657.—*B. foetida* var. *typica* Trautv. in Tr. Peterb. Bot. Sada, IV, 1 (1876) 161.—*B. foetida* var. *viscosissima* Trautv. op. cit. (1876) 162.—*B. rhoeadifolia* auct. non Rchb.: 690 Asker. in Fl. Azerb. VIII (1961) 564, p. min. p.—*Wibelia graveolens* Gaertn. Mey. and Scherb. Fl. Wett. III, 1 (1801) 144.—*W. foetida* (L.) Schultz in Jahresbericht Pollichina XX–XXI (1863) 172.—*Hostia foetida* (L.) Moench Meth. Suppl. (1802) 221.—*Anisoderis foetida* (L.) Fisch. and Mey. Ind. sem. hort. Petrop. IV. (1837) 32.—*Rhynchopappus foetidus* (L.) Dulac. Fl. Hautes-Pyr. (1867) 493.—*Hieracioides foetidum* (L.) O. Ktze. Rev. gen. I (1891) 346.—*Id.*: Javorka and Csapody, Inconogr. Fl. Hung. 562, fig. 4036; Babč. op. cit. (1947) fig. 217.—*Exs.*: Fl. exs. austrohung. No. 3414; Fl. Gall. et Germ. exs. cent. 3, No. 97; Rchb. Fl. Germ. exs. No. 2532; Billot. Fl. Gall. et Germ. exs. Nos. 810 and 810 bis; Sch. Bip. Cichoriaceothesca No. 641 Fl. Graeca exs. No. 342.

Annual, rarely biennial. Very similar to *C. rhoeadifolia* M.B., but differs from it by having the involucre bracts and most of the peduncles pubescent with dense (especially the involucre bracts), trichoid and setaceous, yellowish or reddish-brown, glandular hairs, narrower campanulate involucre, and outer involucre bracts that are usually half as long as the inner. Chromosomes $2n = 10$. Flowering May to June.

Dry herb slopes, scrubs, coastal sands, wormwood semidesert, weedy places; lowlands to lower mountain zone.—*European Part*: Middle

Dnieper (vicinity of Kharkov and Mogilev-Podolskii, introduced), Black Sea Region (vicinity of Kherson), Crimea (Lake Donuzlav, Yalta, near Arbat); *Caucasus*: Ciscaucasia (vicinity of Maykop and Nalchik), Dagestan (Derbent, Madzhalis), Eastern Transcaucasia, Western Transcaucasia (vicinity of the village of Smekalovka of the former Batumi District, along road to the village of Gachedyl in Mingrelia), Southern Transcaucasia (vicinity of Ordubad and Krasnoselsk; in the latter locality probably introduced), Talysh. *General distribution*: All of Europe except Scandinavia, Asia Minor, Armenia and Kurdistan, Mount Ararat), Iran (western part of Iran), as an introduction in Algeria, and Island of Madeira and the Canary Islands. Described from France. Type in London.

48. **C. *rhoeadifolia*** M.B. Fl. taur.-cauc. II (1808) 259, III (1819) 538; Grossh. Fl. Kavk. IV (1934) 260; Kolak. Fl. Abkhazii IV, 309; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 745.—*C. foetida* auct. non L.: M.B. op. cit. (1808) 257; Bess. Enum. pl. Volhyn. (1822) 31.—?*C. rhagadioloides* Georgi, Besch. Russ. Reichs. III, 5 (1800) 1214, nomen.—*C. echioides* Ldb. Ind. sem. hort. Dorpat. (1821) 23 and Fl. Ross. II, 2, 820, in obs. — *C. foetida* Y. *hispida* Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 252.—*C. foetida* β. *rhoeadifolia* (M.B.) Boiss. Fl. or. III (1875) 851; Schmalh. Fl. II, 151 (var.); Fedtsch. and Fler. Fl. Evrop. Ross. 1063 (var.); Nikitin in Fl. Turkm. VII, 350 (var.).—*C. foetida* Y. *maritima* Boiss. op. cit. (1875) 851, p. p.—*C. foetida* var. *arenicola* Lipsky in Tr. Peterb. Bot. Sada, XIII, 2 (1894) 227, XIV, 2 (1898) 286 and Fl. Kavk. 373.—*C. foetida* ssp. *rhoeadifolia* (M.B.) Schinz and Keller, Kr. Fl. Schweiz, ed. 3 (1914) 361; Kraschen. in Fl. Yugo-Vost. VI, 474; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 695 (The Genus *Crepis*, 2); Dostal, Klič (1958) 637.—*C. rhoeadifolia* var. *arenicola* (Lipsky) Grossh. Fl. Kavk. IV (1934) 260.—*C. rhoeadifolia* var. *maritima* (Boiss.) Grossh. op. cit. (1934) 260.—
- 691 *Barkhausia foetida* auct. non F.W. Schmidt: C.A.M. Verzeichen. (1831) 57.—*B. rhoeadifolia* (M.B.) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1412; DC. Prodr. VII, 1, 158; Ldb. Fl. Ross. II, 2, 819, excl. specim. nonnull.; Grossh. Oprod. Rast. Kavk. 517; Papava in Fl. Gruzii VIII, 695; Geideman, Oprod. Rast. Mold. SSR, 304; Klovok in Vizn. Rosl. URSR, 594; Asker. in Fl. Azerb. VIII, 564, p. p.—*B. bizantina* DC. op. cit. (1838) 158.—*B. rhoeadifolia* α. *genuina* C. Koch in Linnaea XXIII (1850) 685.—*B. rodigioides* Sch. Bip. ex C. Koch, op. cit. (1850) 687.—*B. foetida* var. *rhoeadifolia* (M.B.) Trautv. in Tr. Peterb. Bot. Sada, IV, 1 (1876) 162.—*B. rhoeadifolia* var. *maritima* (Boiss.) Papava in Fl. Gruzii VIII (1952) 695.—*Anisoderis rhoeadifolia* (M.B.) Fisch. and Mey. Ind. sem. hort. Petrop. IV (1837) 32.—**Ис.**: Javorka and Csapody, Iconogr. Fl. Hung. 562, fig. 4035; Bab. op. cit. fig. 219 and pl. 18, a, b; Dostal. op. cit. t. 223, fig. 2177; Nikitin, op. cit. Plate LVIII.—**Exs.**: Fl. exs. austro-

hung. No. 3415; Callier, Fl. siles. exs. No. 852; Petrak, Fl. Bohem. et Morav. exs. No. 980; Degen, Pl. Hung. exs. sine numero.

Annual or biennial. Root vertical or oblique. Stem. mostly solitary (10)20–60(80) cm high, ascending or erect, finely ribbed-sulcate, solid, usually branched from the middle or base, with lax branches, leafy; including leaves covered with rather long, distant, bent, eglandular, whitish, stiff, setaceous, green hairs, sometimes dark violet below or throughout. Basal and lower cauline leaves to 20 cm long and to 4–5 cm wide, oblanceolate, oblong-oblanceolate, less often elliptical-oblanceolate, subobtusate to acute, sinuate-toothed, often pinnatilobate, runcinately pinnatipartite or pinnatisect, mostly with large terminal lobe and wide deltoid or oblong-lanceolate, acute, remotely toothed lateral lobes, reducing toward leaf base, gradually narrowed into short narrow-winged petiole; middle cauline leaves like basal and lower cauline oblong or oblong-lanceolate, sessile, with acute auricles; apical leaves usually strongly reduced, linear, entire. Capitula in lax, mostly compound corymbose inflorescence, drooping before flowering. Involucre broadly campanulate at fruiting, (9)11–15 mm long and (6)8–12 mm wide; involucre bracts covered with dense, more or less long, eglandular, yellowish bristles, in addition weakly short arachnoid-hairy, sometimes mixed with fewer glandular hairs; outer involucre bracts 9–13, of unequal length, linear-lanceolate, acute, without scarious border, half to two-thirds as long as inner, sometimes some of them scarcely shorter; inner involucre bracts 12–14, of equal length, oblong-lanceolate, narrowed toward the apex, subobtusate, with scarious border, densely appressed pubescent on the inner surface, keeled at fruiting, overlapping peripheral achenes, with spongy thickening on midrib in the lower part. Receptacle densely ciliate-fimbriate. Florets yellow, often reddish-purple on the outer surface of ligules. Corolla 9–20 mm long; ligule about 2 mm wide; corolla tube 4–6(8) mm long, pubescent with scattered short acicular hairs. Style branches dark green, greenish or yellow, Achenes of two types: peripheral—light reddish-brown, 5–7 mm long and 0.6–0.8 mm wide, fusiform, scarcely compressed, strongly narrowed toward apex, without beak or with very short coarse beak, with 17, more or less distinct, rounded ribs or indistinctly ribbed, pubescent with fine (under high magnification!) white acicular hairs; inner ones reddish-brown, 10–13(16) mm long (including beak); body 4–6 mm long and 0.4–0.5 mm wide, fusiform, gradually attenuated into slender, 5–8(10) mm long beak, with 17–18 narrow prominent ribs, densely covered with very fine (under high magnification!), erect, spiny or papillate hairs, hairs also on beak; pappus 6–8 mm long, shorter in peripheral achenes, 4.5–6.0 mm long, white, persistent, much longer than involucre. Chromosomes $2n = 10$. Flowering June to August.

Steppes, sandy places and coastal sands, hillocks, among scrubs, stony

and rubbly herb slopes, weedy places; lowlands to middle mountain zone, up to 2,000 m.—*European Part*: Upper Dnieper (southern part), Middle Dnieper (western part), Upper Dniester, Bessarabia, Black Sea (western half of the region), Crimea, Lower Don (south), Lower Volga (Kizlyar, ?Astrakhan); *Caucasus*: All regions; *Soviet Central Asia*: mountainous Turkmenia (Keshi in vicinity of Ashkhabad). *General distribution*: central Europe (southern part), Balkans-Asia Minor, Armenia and Kurdistan, Iran (northern part). Described from Crimea. Type in Leningrad.

49. **C. trichocephala** (Krasch.) V.V. Nikit. in Fl. Turkm. VII (1960) 354; Kraschen. in Bot. Mat. Gerb. Bot. Inst. Akad. nauk SSSR, IX, 4–12 (1946) 186, pro syn.—*Barkhausia trichocephala* Krasch. ibid. (1946) 182; Kovalevskaya in Fl. Uzb. VI, 501.—*B. jakkabaghi* M. Pop. in Tr. Uzb. Gos. Univ. Nov. Ser. 27, Biol. 14 (1941) 101, descr. rossica.—**!c.**: Kovalevskaya, op. cit. Plate L, Fig. 3.

Annual. Root vertical. Stem mostly solitary, 15–40(60) cm high, erect, weakly ribbed, cylindrical, solid, branched above or from the base, with upward spreading branches, sparsely leafy, covered more or less with scattered, long, distant, flexuous, eglandular, whitish, thin setaceous hairs, mixed with fewer, much shorter, glandular, slightly reddish-brown hairs in upper part (usually including apical leaves), less often throughout, green or reddish violet in lower half, Basal and lower cauline leaves 5–16(22) cm long (including petiole) and 0.8–3.0 (5.0) cm wide; oblong-ob lanceolate, or oblanceolate, subobtusate to subacute, with small teeth, sinuate-toothed, less often shallow sinuate-pinnatifid, gradually narrowed into very short winged petiole, including middle cauline leaves pubescent with scattered, eglandular, whitish, setaceous hairs, sometimes
693 subglabrous, green; middle and upper cauline leaves oblong or linear-lanceolate, acuminate, entire, with irregular teeth or with one or two (three) basal lobes, sessile, mostly semiamplexicaul; apical leaves strongly reduced, narrowly linear or bracteiform. Capitula in lax, usually simple corymbose inflorescence, erect. Involucre broadly campanulate at fruiting, about 15 mm long and (10)12–15(18) mm wide; involucre bracts densely covered with long, curved, eglandular, whitish, thin, setaceous hairs and short glandular, pale hairs on outer side; outer involucre bracts 11–16, of unequal length, narrowly linear-lanceolate, acute, without scarious border, half (two-fifths) to two-thirds as long as inner; inner bracts 14–20, of equal length, oblong-lanceolate, narrowed toward the apex, subobtusate, with scarious border, scatteredly appressed-pubescent on the inner surface in the upper part, not deflexed at fruiting, overlapping peripheral achenes, obtuse-keeled on outside, thickened. Receptacle foveolate-fimbriate, with thin and ciliolate fimbria. Florets yellow, purple on the outer surface of ligule. Corolla 12–14 mm long, corolla tube 5–6

mm long, with isolated, thin, flexuous hairs above, glabrous below. Style branches yellow. Achenes of two types: peripheral—greenish-yellowish, slightly compressed, 6.5–8.5 mm long and 0.6–0.7 mm wide, gradually attenuated into very short coarse beak, slightly curved, longitudinally striped, pubescent on the inside with short, straight or slightly flexuous, white hairs, subglabrous on the outside; inner—reddish-brown, 12–16 mm long (including beak), body 6–7 mm long and 0.5–0.6 mm wide, fusiform, gradually attenuated into slender, 6–9 mm long beak, longitudinally striped, covered with very fine (visible under high magnification!) erect, spiny or papillate hairs, hairs also on beak; pappus 7.0–8.5 mm long, shorter in peripheral achenes, white, persistent, much longer than involucre. Flowering May to June. (Plate XXXIII, Fig. 2).

Stony slopes and along clayey-sandy, sandy-gravelly valleys of mountain rivers; in foothills.—*Soviet Central Asia*: Pamiro-Alai, mountainous Turkmenia (Badkhyz). Endemic. Described from Kushka and village of Alekseevskaya. Type (lectotype) in Leningrad.

50. *C. kotschyana* Boiss. Diagn. pl. or. ser. I, 7 (1846) 13 and Fl. or. III, 852; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 707 (The Genus *Crepis*, 2); Nikitin in Fl. Turkm. VII, 352.—*C. bureniana* Boiss. op. cit. (1875) 852; O. and B. Fedtsch. Perech. Rast. Turk. IV, 343.—*C. glanduligera* (Winkl.) B. Fedtsch. Rast. Turk. (1915) 765.—*Barkhausia glanduligera* Winkl. in Tr. Peterb. Bot. Sada, XI, 2 (1892) 325.—*B. bureniana* (Boiss.) Winkl. op. cit. (1892) 326, in obs.—*B. kotschyana* (Boiss.) S. Koval. in Fl. Uzb. VI, (1962) 501.—*Hieracioides burenianum* (Boiss.) O. Ktze. Rev. gen. I (1891) 345, "*Hieraciodes*".—*H. kotschyana* (Boiss.) O. Ktze. op. cit. (1891) 346, "*Hieraciodes*".—*Icon.*: Bab. op. cit. fig. 224; Nikitin, op. cit. Plate LIX.—*Exs.*: Kotschy, Pl. Pers. austr. Nos. 173 and 289; Bornm. It. Pers.-turc. 1892–1893, No. 5140.

Annual. Root vertical, slender, Stem solitary, 5–20 cm high, erect, cylindrical, solid, divaricately branched from middle or base, sometimes straight, leafy, grayish tomentose, glandular-short hairy, often mixed with rather long, somewhat spreading, slightly curved, eglandular, slightly yellowish, thin, setaceous hairs. Basal leaves 1.5–3.5 cm long (including petiole) and 0.5–0.8 cm wide, oblong-oblancheolate, obtuse, with remote small teeth, gradually narrowed into very short, winged petiole, glabrous, early-withering; middle and upper cauline leaves 2.5–6.5(10.0) cm long and 0.8–2.0(3.0) cm wide, oblong, ovate-lanceolate, or oblong-lanceolate, obtuse, with small mucro or obtuse, with remote small teeth, less often more or less coarsely sinuate-toothed with acute chondroid small or big teeth, sessile, semiamplexicaul, with lower cauline leaves similar in shape to basal, slightly arachnoid-hairy or finely grayish tomentose, moreover usually glandular-short-hairy, less often with occasional long, setaceous

hairs along midrib. Capitula in lax, mostly compound corymb, sometimes single on plant, erect, on slightly curved or erect peduncles, scarcely thickened below capitula. Involucre broadly campanulate, 10–11 mm long and 10–13(15) mm wide; involucre bracts grayish-tomentose on the outside, densely covered with short, glandular, yellowish hairs, often mixed with numerous, long, eglandular, yellowish, thin, setaceous hairs; outer involucre bracts 13–16, of unequal length, linear, acute, without scarious border, (half) one-third to one-fourth as long as inner; inner bracts 13, of equal length, oblong-lanceolate, acuminate, with wide scarious border glabrous on inner surface, keeled at fruiting, laterally compressed, overlapping peripheral achenes, obtusely keeled on the outside, thickened. Receptacle bulged, foveolate, glabrous. Florets yellow, purple on outer surface of ligules. Corolla 8.0–8.5 mm long; corolla tube 4.0–4.5 mm long, with scattered short hairs in the upper part. Style branches yellow. Achenes of two types: peripheral—thick, yellow, 5–6 mm long and 1.0–1.5 mm wide, laterally compressed, oblong, falcate, obtuse, without beak, pubescent on the inner surface with rather dense, short, somewhat appressed, whitish, thin hairs, longitudinally striped on outer surface, subglabrous, inner ones reddish-brown, 9–13 mm long (including beak); body 5–6 mm long, about 0.5 mm wide fusiform, gradually attenuated in thin, 4–7 mm-long beak and with 15 very thin ribs densely covered with very fine (visible under high magnification!), erect, spiny or papillate hairs, hairs also in the lower part of beak; pappus 6–7 mm long, white, persistent, much longer than involucre. Chromosomes $2n = 8$. Flowering April to May.

Rubbly and clayey slopes; in foothills and lower mountain zone.—*Soviet Central Asia*: Mountainous Turkmenia (western Kopetdag, Badkhyz), Pamiro-Alai. *General distribution*: Iran (Iran and Baluchistan), Iraq, Syria. Described from southern Iran. Type in Geneva; duplicate of the type in Leningrad.

Section 14. *Lepidoseris* (Rchb.) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 215 (The Genus *Crepis*, 2).—*Barkhausia* auct. p. p. non Moench: DC. in Lam. and DC. Fl. Fr. ed. 3, IV (1805) 41 and auct. al. europ. et ross.—*Lagoseris* Hoffm. and Link, Fl. Port. II (1820) 149, p. p.; Link, Enum. Pl. hort. Berol. II (1822) 289, p. p. non M.B. (1810).—*Crepis* sect. *Barkhausia* (Moench) Gaudin, Fl. Helv. V (1829) 130, p. p. “*Barkhausia**; Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 246, 249, p. p.; Boiss. Fl. or. III (1875) 832, p. min. p. “*Barckhausia*”; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 373, p. p.—*Barkhausia* d. *Lepidoseris* Rchb. Fl. germ. excurs. I (1830) 256, descr. and in Moessl. Handb. ed. 2, II, 2 (1829) 1408, nomen.—*Barkhausia* c. *Lagoseris* Rchb. op. cit. (1830) 256, p. p. descr. and (1829) 1407, p. p. nomen.—*Barkhausia* sect. *Lepidoseris*

(Rchb.) DC. Prodr. VII, 1 (1838) 153, p. max. p.—*Barkhausia* sect. *Aegoseris* (Rchb.) Dc. op. cit. (1838) 154, p. min. p.—*Crepis* sect. *Barkhausia* §2. Koch, Synops. ed. 2, 2 (1884) 501, p. p.—*Crepis* subgen. *Lepidoseris* (Rchb.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 312.—*Rhynchopappus* Dulac, Fl. Hautes-Pyr. (1867) 493, p. p.—*Lepidoseris* (Rchb.) Fourr. in Ann. Soc. Linn. Lyon. nouv. ser. XVII (1869) 103.—*Crepis* sect. *Lagoseris* Benth. in Benth. and Hook. f. Gen. pl. II (1873) 513, p. p.—*Crepis* subgen. *Barkhausia* (Moench) Schmalh. Fl. II (1897) 151, p. p.—Biennial, pubescent plant. Root virgate, woody, vertical; caudex leafy, mostly one-stemmed. Stem erect, stiff, (20)30–70 cm high, branched above or from the middle, leafy. Basal and lower cauline leaves oblong-ob lanceolate or oblanceolate, sinuate-toothed, to lyrate pinnatifid, petiolate; middle and upper cauline oblong-lanceolate to linear, gradually reduced, sessile. Capitula medium, with many florets, aggregated in compound corymbose inflorescence; outer involucre bracts one-third to half as long as inner; inner bracts pubescent on the inner surface, keeled on the outside at fruiting, hardened at base. Receptacle foveolate, ciliolate. Corolla 9–10 mm long and 3.0–3.5 mm long corolla tube, more or less densely pubescent with short acicular hairs. Achenes all alike, pale reddish-brown, 6.5–8.0 mm long (including beak), fusiform, narrowed toward base, gradually attenuated into filiform, 3.5–4.5 mm long beak, with 10 longitudinal ribs; pappus white, about 5 mm long, somewhat longer than involucre.

Type (lectotype) of section: *C. vesicaris* L.

- 696 51. *C. marschallii* (C.A.M.) F. Schultz in Flora XXIII (1840) 718; Boiss. Fl. or. III, 854; Schmalh. Fl. II, 152; Fedtsch. and Fler. Fl. Evrop. Ross. 1063; Grossh. Fl. Kavk. IV (1934) 260; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 863 (The Genus *Crepis*, 2); Kolak. Fl. Abkhazii IV, 310.—*C. biennis* auct. non L.: M.B. Fl. taur.-cauc. II (1808) 257, excl. syn. nonnull.—*C. taurinensis* auct. non Willd.: M.B. ibid. III (1819) 537, excl. syn. nonnull.—*Barkhausia marschallii* C.A.M. Verzeichn. (1831) 57; DC. Prodr. VII, 1, 153; Ldb. Fl. Ross. II, 2, 818; Grossh. Opred. Rast. Kavk. 518; Stank. and Tal. Opred. Vyssh. Rast. ed. 1, 697; Papava in Fl. Gruzii VIII, 696; Asker. in Fl. Azerb. VIII, 565.—*Hieracioides marschallii* (C.A.M.) O. Ktze. Rev. gen. I (1891) 346, "*Hierociodes*"—Ic.: Bab. op. cit. fig. 285.

Biennial. Root woody, vertical; caudex very short, simple. Stem one (rarely two or three), (20)30–70 cm high, coarse, erect, ribbed-sulcate, hollow, branched above or from base, leafy, weakly short-woolly or short-setose throughout, moreover, in inflorescence short- and thin glandular hairy. Leaves scatteredly setose on both surfaces (more densely on margin and beneath along midrib) from short eglandular pale hairs, less often

subglabrous; basal and lower cauline leaves to 18(21) cm long and 2–4(5) cm wide, oblong-ob lanceolate, acute or obtuse, sinuate-toothed to runcinately pinnatifid, with large terminal lobe and deltoid or oblong-lanceolate, acute, lateral lobes with remote teeth, gradually reduced toward the leaf base, narrowed into short, winged petiole broadened toward base; middle cauline leaves oblong-lanceolate, less often almost oblong, acute, or subobtuse, sinuate-toothed or narrow-pinnatifid, sessile, semiamplexicaul, with short auricles; apical leaves strongly reduced, narrowly linear. Capitula rather numerous, in compound corymbose inflorescence. Involucre cylindrical-campanulate, 10–12 mm long and 5–6(7) mm wide; involucre bracts woolly on outer side and rather densely pubescent with short and thin reddish-brown, glandular hairs; outer involucre bracts five to seven, of almost equal length, ovate-lanceolate or ovate, subobtuse, with wide scarious border, one-third to half as long as inner; inner bracts 12–13, of equal length oblong-lanceolate, obtuse, with scarious border (innermost), white hairy along upper margin, more or less densely appressed pubescent on the inner surface, obtusely keeled on the outside at fruiting, thickened at the base, reflexed. Receptacle foveolate, walls of pits membranous, ciliolate above. Florets yellow, purple on outer surface of ligules. Corolla 9–10 mm long; ligules 1.0–1.2 mm wide, in the lower half pubescent on the outside with scattered short, acicular, hyaline, appressed hairs; corolla tube 3.0–3.5 mm long, very thin, more or less densely pubescent with appressed, stiff, acicular hairs.

697 Style branches dark green. Achenes all alike, pale reddish-brown, 6.5–8.0 mm long (including beak), body 3.0–3.5 mm long, about 0.4 mm wide, fusiform, narrowed toward the base, gradually attenuated into filiform, 3.5–4.5 mm-long beak, with narrow, rounded, prominent ribs bearing very fine (visible under high magnification!), erect, spiny hairs; pappus about 5 mm long, white, soft, readily detaching, somewhat longer than involucre. Chromosomes $2n = 8$. Flowering May to June. (Plate XXXIII, Fig. 1).

In scrubs, dry herb slopes, gardens and weedy places; lowlands to lower mountain zone.—*European Part*: Crimea; *Caucasus*: Ciscaucasia, Dagestan, Eastern Transcaucasia, Western Transcaucasia (northern part), Talysh. *General distribution*: Iran (northern part). Described from Eastern Transcaucasia. Type in Leningrad.

Section 15. Nemauchenses (Cass.) Benth. in Benth. and Hook. f. Gen. pl. II (1873) 514; O. Hoffm. in Pflanzenfam. IV, 5 (1894) 374; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 216 (The Genus *Crepis*, 2).—*Barkhausia* auct. p. p. non Moench: DC. in Lam. and DC. Fl. Fr. ed. 3, IV (1805) 41 and auct. al. europ. et ross.—*Nemauchenes* Cass. in Bull. Soc. Philom. Paris (1818) 77.—*Crepidium* Tausch in Flora IX, 1 (1828) 80, p. p. non Blume (1825).—*Crepis* sect. *Barkhausia* Gaudin, Fl. Helv.

V. (1829) 130, p. min. p. "*Barckhausia*": Bisch. Beitr. Fl. Deutschl. Schweiz (1851) 246, 249, p. min. p.; Boiss. Fl. or. III (1875) 832, p. min. p. "*Barckhausia*".—*Barkhausia* a. *Nemauchen*es (Cass.) Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1405, p. p. and Fl. germ. excurs. I (1830) 255.—*Barkhausia* b. *Aegoseris* Rchb. op. cit. (1830) 255, p. p. descr. and (1829) 1406, p. p. nomen.—*Barkhausia* sect. *Aegoseris* (Rchb.) DC. Prodr. VII, 1 (1838) 184, p. min. p.—*Barkhausia* sect. *Anisoderis* (Cass.) DC. ibid. (1838) 157, p. min. p.—*Endoptera* sect. *Nemauchen*es (Cass.) DC. ibid. (1838) 179.—*Aegoseris* (Rchb.) Steud. Nomencl. ed. 2, I (1840) 30.—*Crepis* sect. *Barkhausia* §2. Koch, Synops. ed. 2, 2 (1844) 501, p. p.—*Crepis* subgen. *Aegoseris* (Rchb.) Sch. Bip. in Jahresbericht Pollichia XXII–XXIV (1866) 312, p. min. p.—*Crepis* sect. *Gatyona* (Cass.) Boiss. op. cit. (1875) 832, p. p.—*Crepis* subgen. *Barkhausia* (Moench) Schmalh. Fl. II (1897) 151, p. p.—Annual, pubescent. Root virgate, slender, vertical; caudex leafy, one-stemmed. Stem erect, 20–70(85) cm high, branched above or almost from base, leafy. Basal and lower cauline leaves oblanceolate or oblong-oblanceolate, sinuate-toothed to runcinately pinnatifid, petiolate; middle and upper cauline leaves oblong-lanceolate, gradually reduced, sessile. Capitula medium, with many florets, aggregated in compound corymbose-paniculate inflorescence. Outer involucre half as long as inner, inner ones pubescent on the inner surface, strongly
698 keeled on the outside at fruiting with spongy thickening at the base. Receptacle indistinctly alveolate, ciliolate. Corolla 10–13 mm long, with 3–4 mm-long tube, sparsely pubescent with short acicular hairs. Achenes all alike, pale reddish-brown, 3.7–5.0(5.5) mm long (including beak), fusiform, narrowed toward base, more or less abruptly or gradually attenuated in thin, 1.5–2.5 mm-long beak, with 10 longitudinal ribs; pappus white, about 5 mm long, slightly longer than involucre.

Type of section: *C. aspera* L.

52. *C. setosa* Haller f. in Roem. Arch. bot. I, 2 (1797) 1; Boiss. Fl. or. III, 853; Schmalh. Fl. II, 151; Fedtsch. and Fler. Fl. Evrop. Ross. 1063; Grossh. Fl. Kavk. IV (1934) 260; Kolak. Fl. Abkhazii, IV, 309; Szaf. Kulcz. Pawl. Rosl. Polskie (1953) 745; Dostal, Klič (1958) 637.—*C. hispida* Waldst. and Kit. Descr. et icon. pl. rar. Hung. I (1802) 42; M.B. Fl. taur.-cauc. II, 259, III, 538.—*C. bonnatia* Willd. Enum. pl. hort. Berol. Suppl (1813) 55.—*C. setosa* ssp. *typica* Bab. in Univ. Calif. Publ. Bot. 22 (1947) 882 (The Genus *Crepis*, 2).—*Barkhausia setosa* (Haller f.) DC. in Lam. and DC. Fl. Fr. ed. 3, IV (1805) 44; DC. Prodr. VII, 1, 155; Ldb. Fl. Ross. II, 2, 819; Grossh. Opred. Rast. Kavk. 518; Stank. and Tal. Opred. Vyssh. Rast. ed. 1. 697; Papava in Fl. Gruzii VIII, 695; Geideman, Opred. Rast. Mold. SSR, 304.—*B. hispida* (Waldst. and Kit.) Link, Enum. pl. hort. Berol. II (1822) 290, "*Barkhausia*".—

Wilbelia setosa (Haller f.) Roehl. Deutschl. Fl. ed. 2, II (1812) 582.—*Aegoseris setosa* (Haller f.) Fourr. in Ann. Soc. Linn. Lyon, nouv. ser. XVII (1869) 103.—*Hieracioides setosum* (Haller f.) O. Ktze. Rev. gen. I (1891) 346, "*Hieraciodes*".— **Ic.**: Waldst. and Kit. op. cit. t. 43; Rchb. Ic. Fl. Germ. XIX, t. 1435; Javorka and Csapody, Ic. Hung. 562, fig. 4037; Dostal, op. cit. t. 223, fig. 2176; Babč. op. cit. fig. 292.— **Exs.**: Sch. Bip. Cichoriaceotheca, No. 61; Schultz, Herb. norm. cent. 1, No. 90, and cent. 11, No. 90 bis; Fl. exs. austro-hung. No. 3416; Billot. Fl. Gall. et Germ. exs. No. 1259; Fl. Gall. et Germ. exs. cent. 2, No. 34; Rchb. Fl. Germ. exs. No. 835; Callier. Fl. siles. exs. No. 628; Fl. exs. reip. Bohem. Slov. No. 986; Pl. Bulg. exs. cent. IV, No. 400; Pl. Hercegov. exs. No. 203.

Biennial. Root slender, vertical. Stem single, 20–70(85) cm high straight or curved, ribbed-sulcate, solid, branched above or almost from the base, leafy, covered with distant, rather long, erect, eglandular yellowish, basally reddish-violet bristles. Leaves pubescent on both surfaces with scattered, eglandular, whitish, setaceous hairs; basal and lower cauline leaves oblanceolate or oblong-oblanceolate, acute or subobtusate, sinuate-toothed to runcinately pinnatipartite, less often lyrate pinnatisect, with large terminal lobe and triangular or oblong-lanceolate, acute, toothed lateral lobes, narrowed into very short, winged petiole broadened at the base, early-withering; middle and upper cauline leaves oblong-lanceolate, acuminate, toothed or basally deeply incised, sessile, auriculate, with cuspidate auricles; apical leaves strongly reduced, linear. Capitula in compound corymbose-paniculate inflorescence. Involucre cylindrical-campanulate, (7) 8–10 mm long, 5–7 mm wide; involucre bracts with more or less long, eglandular, yellowish, stiff bristles on the outside, basally distinctly broadened, very slightly arachnoid-hairy; outer involucre bracts 10–14, of somewhat unequal length, linear-lanceolate, acuminate, without scarious border, keeled, lax, half as long as inner; inner involucre bracts 12–13, of equal length, oblong-lanceolate, acuminate, with scarious border, densely appressed pubescent on the inner surface, weakly keeled on the outside at fruiting, with spongy thickening at the base. Receptacle indistinctly alveolate, interrupted, scarcely noticeable wall of alveoli ciliolate above. Florets yellow, sometimes red on outer surface of ligules. Corolla 10–13 mm long; ligule to 1.7 mm wide, pubescent in the lower part on the outside with short acicular hairs; corolla tube 3–4 mm long, pubescent with sparse acicular hairs. Style branches dark green. Achenes all alike, pale reddish-brown, 3.7–5.0(5.5) mm long (including beak); body 2.2–2.5(3.0) mm long, and 0.4–0.5 mm wide, fusiform, scarcely narrowed toward the base, more or less abruptly or gradually attenuated in slender, 1.5–2.5 mm-long beak, with 10 narrow, rounded, more or less prominent ribs bearing very fine (visible under high magnification!), erect, spiny hairs, hairs also on beak, almost smooth

below; pappus about 5 mm long, soft, readily detaching, slightly longer than involucre. Chromosomes $2n = 8$. Flowering May to August.

Weedy places, old fields, dry stony places; lower lands.—*European Part*: Bessarabia, Crimea (southern part); *Caucasus*: Western Transcaucasia. *General distribution*: central Europe, southern Europe, Balkans-Asia Minor. Described from Switzerland. Type unknown.

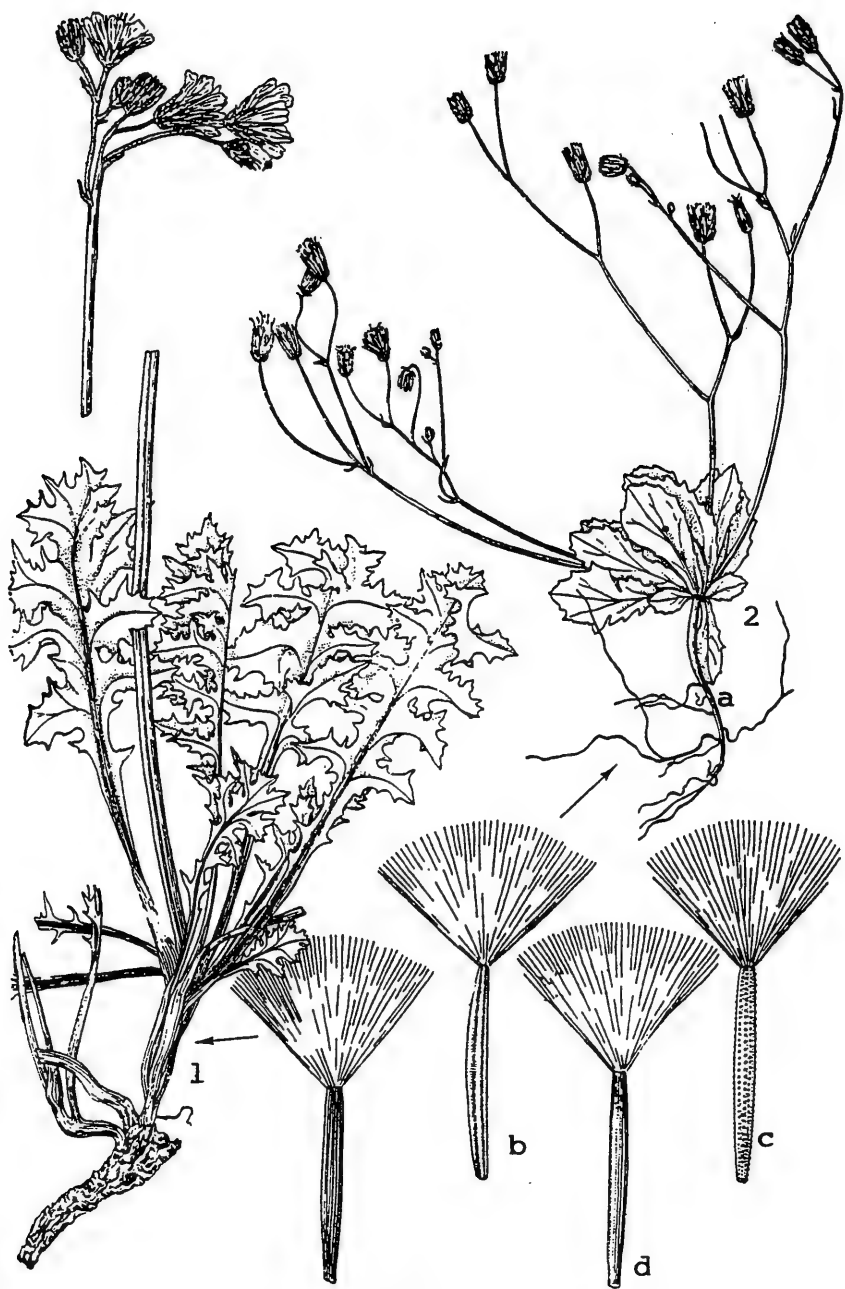
GENUS 1674. *Lagoseris* M.B.^{1,2}

M.B. Centur. pl. rar. Ross. merid. I (1810) t. XXX; Fl. taur.-cauc. III (1819) 538; Boiss. Fl. or. III (1875) 881, non Hoffm. and Link (1820).—*Crepis* auct. p. min. p. non. L.: M.B. Fl. taur.-cauc. II (1808) 255; Boiss. op. cit. 831; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 207 (The Genus *Crepis*, 2).—*Pterotheca* Cass. in Bull. Soc. Philom. Paris (1816) 200, (1821) 125; in Dict. sc. nat. XXV (1822) 62, XLIV (1826) 56, XLVIII (1827) 422, XL (1830) 568; Benth. in Benth. and Hook. f. Gen. pl. II (1873) 516; O. Hoffm. in Pflanzenfam. IV, 5 (1893) 368.—*Intybellia* Cass. in Bull. Soc. Philm. Paris. (1821) 124, non Monn. (1829).—*Myoseris* Link, Enum. pl. hort. Berol. II (1822) 291.—*Trichocrepis* Vis. Stirp. Dalm. (1826) 18.—*Crepinia* Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1415.—*Derouetia* Boiss. and Bal. in Boiss. Diagn. pl. or. ser. II 5 (1856) 114.—*Hieracioides* auct. p. min. p. non. Rupr.: O. Ktze. Rev. gen. I (1891) 344, "*Hieraciodes*."

- 700 Capitula homogamous, medium or small, with many florets, aggregated into lax corymbose inflorescence. Involucre short-cylindrical or campanulate, 2.5–8.0 mm wide; Involucral bracts ovate- and deltoid-lanceolate outer to oblong-lanceolate inner, acute, with glandular or eglandular hairs on the outside or somewhat stiff bristles, less often appressed-arachnoid, arachnoid-woolly or glabrous, glabrous on the inner surface; outer bracts 5–14, one- or two-rowed, of unequal or almost equal length, one-sixth to half as long as inner; inner bracts (8)10–16, two-rowed, of equal length, with scarious border (particularly innermost), slightly keeled outside at fruiting, with spongy thickening. Receptacle covered with fewer erect, setaceous scales much longer than achenes but slightly shorter than pappus. All florets purple or yellow, one and one-half to two times as long as involucre, of one type, bisexual. Corolla 9–16 mm long, limb with fine teeth; corolla tube one-fourth to one-third as long as corolla, pubescent entirely or in the upper part with flexuous, multicellular, hyaline hairs. Anthers with small acute or short-setaceous, acuminate appendages; filaments flattened, glabrous. Style bifid, its

¹ Treatment by S.K. Czerepanov.

² From the Greek words *lagos*—hare, and *seris*—lettuce, salad; so named because it is relished by hares.



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Plate XXXIV.

1—*Lagoseris callicephala* Juz.; 2 —*L. glaucescens* (C. Koch) Sosn.:
 a—habit; b—peripheral achene; c—central achene; d—inner achene.

branches green, blackish-green or yellowish, divergent. Achenes all alike, 4.5–7.0 mm long, linear, without beak, slightly narrowed at both ends, somewhat curved or straight, with 10–12 prominent, rounded, very finely spinose or smooth ribs, or achenes heteromorphic; peripheral (outer) fewer, (3.5)4.0–6.5 mm long, linear-lanceolate, slightly narrowed toward the apex, mostly slightly curved with three distinct smooth ribs; middle (intermediate) achenes usually numerous, (3.2)3.5–5.0(6.0) mm long, terete, linear, somewhat narrowed at both ends, with 10 thin ribs, densely covered with very fine, papilliform, scaly hairs; inner achenes like middle but their ribs smooth, lower areola straight; pappus as long as achenes or slightly shorter, comprising numerous persistent scabrous-serrate or smooth, soft, nonfragile hairs of equal length, connate into a ring. Perennial or annual herb, with erect or ascending, almost leafless stems and runcinately pinnatipartite, lyrate, pinnatilobate or sinuate-toothed leaves arranged in basal rosette.

Type of genus: *L. purpurea* (Willd.) Boiss.

The genus comprises 13 species, of which we have 9.

- 702 1. Perennial. Outer involucre bracts 10–14, one-fourth to half as long as inner. Achenes all alike, pappus hairs scabrous-serrate 2.
- + Annual. Outer involucre bracts 5–8(10), one-sixth to one-fourth (one-third) as long as inner. Achenes heteromorphic, pappus hairs smooth 5.
2. Florets pinkish-purple, style branches green. Achenes with 10 very thin spinose ribs (Crimea) 3.
- + Florets yellow; style branches yellowish. Achenes with 12 smooth ribs (southern Transcaucasia) 4. ***L. sahendi*** (Boiss. and Buhse) Czer.
3. Stems entirely weakly arachnoid-hairy or subglabrous. Involucre bracts appressed grayish-arachnoid-hairy or slightly grayish-arachnoid-tomentose 4.
- + Stems in inflorescence pubescent with mostly dense, very short, yellowish glandular hairs, sometimes mixed with woolly-arachnoid tomentum, weakly arachnoid-hairy in the lower part. Involucre bracts more or less densely covered on the outside with mixture of short and long, mostly yellowish, glandular hairs and somewhat stiff bristles. Achenes 5.5–6.5 mm long and about 0.6 mm wide 3. ***L. callicephala*** Juz.
4. Stem 30–50 cm high, somewhat thick. Leaves of basal rosette 4–13 cm long (including petiole) and 1.5–4.0 cm wide, slightly arachnoid-hairy, weakly woolly-pubescent, sometimes subglabrous. Corolla 15–16 mm long. Achenes 6.0–6.5 mm long and 0.7–0.8 mm wide; pappus 4.5–5.0 mm long 1. ***L. robusta*** Czer.

- + Stem 10–30(35) cm high, somewhat slender. Leaves of basal rosette 2.5–8.0(10) cm long (including petiole), and 0.7–2.0(2.5) cm wide, as also stem base, grayish-arachnoid-hairy or slightly grayish-arachnoid-tomentose. Corolla 10–13(14) mm long. Achenes 4.5–5.0 mm long and 0.5–0.6 mm wide; pappus about 4 mm long ..
..... 2. **L. purpurea** (Willd.) Boiss.
- 5. Style branches blackish-green. Involucral bracts covered with long, mostly somewhat dark, glandular, setaceous hairs on the outside along midrib and stem in the upper part; stem in the lower part, as also leaves, sometimes densely, sometimes sparsely, pubescent with long, mostly whitish eglandular, somewhat stiff hairs
..... 5. **L. sancta** (L.) K. Maly
- + Style branches yellowish 6.
- 6. Involucral bracts entirely glabrous or white-arachnoid-woolly . 7.
- + Involucral bracts short glandular-hairy 8.
- 7. Stem sparsely branched from the middle or lower, glabrous or pubescent in the lower part with scattered, short eglandular hairs. Leaves glaucescent, with short and occasional, mostly spiny hairs along margin and beneath along midrib. Involucral bracts white-arachnoid woolly; outer bracts almost without scarious border (Caucasus) 6. **L. glaucescens** (C. Koch) Sosn.
- + Stem sparsely branched above, with long and rather dense, eglandular hairs in the lower part as also light green leaves (on both surfaces or along margin) and beneath along midrib), glabrous above, short and glandular hairy only in fork of branches. Involucral bracts entirely glabrous, outer ones with wide, scarious white border (Central Kopetdag)
..... 7. **L. obovata** (Boiss. and Noë) Bornm.
- 8. Stem glabrous or pubescent in the lower part with short and sparse eglandular hairs. Involucral bracts densely covered with more or less short, glandular, thin hairs, outer bracts without scarious border, inner bracts 12–13. Corolla 11–13 mm long. Peripheral (outer) achenes 3.5–5.0 mm long and 0.6–0.8 mm wide; middle (intermediate) achenes numerous, reddish-brown, (3.5)4.0–4.5 mm long, about 0.4 mm wide 8. **L. macrantha** (Bge.) Iljin
- + Stem pubescent in inflorescence, less often entirely, as also involucral bracts, with short and sparse glandular hairs, mostly with very short and sparse eglandular hairs in the lower part. Outer involucral bracts with wide scarious border, inner bracts 8–10, 10–11 mm long. Peripheral (outer) achenes (4.5)5.0–6.5 mm long and 0.5–0.7 mm wide; middle (intermediate) achenes fewer, sometimes absent, usually greenish-reddish-brown, 4.5–6.0 mm long and about 4 mm wide 9. **L. aralensis** (Bge.) Boiss.

Subgenus I. *Lagoseris*.—*Crepis* auct. p. min. p. non. L.: M.B. Fl. taur.-cauc. II (1808) 255.—*Lagoseris* M.B. Centur. pl. rar. Ross. merid. I (1810) t. XXX; Fl. taur.-cauc. III, 538, p. p.; Boiss. Fl. or. III, 881, p. p. non Hoffm. and Link (1820).—*Intybellia* Cass. in Bull. Soc. Philom. Paris (1821) 124, non Monn. (1829).—*Myoseris* Link, Enum. pl. hort. Berol. II (1822) 291.—*Derouetia* Boiss and Bal. in Boiss. Diagn. pl. or. ser. II, 5 (1856) 114.—*Pterotheca* auct. p. p. non Cass.: Benth. in Benth. and Hook. f. Gen. pl. II (1837) 516; O. Hoffm. in Pflanzenfam. IV, 5 (1893) 368.—*Crepis* sect. *Eucrepis* §2. *Fusifformes* Boiss. Fl. or. III (1875) 831, p. min. p.—*Hieracioides* auct. p. min. p. non. Rupr.: O. Ktze. Rev. gen. I (1891) 334, "*Hieraciodes*".—*Crepis* sect. *Lagoseris* (M.B.) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 213 (The Genus *Crepis*, 2).—Capitula fewer, on somewhat curved, mostly somewhat thickish peduncles. Outer involucre bracts 10–14, two-rowed, half to one third as long as inner; inner involucre bracts 13–16. Achenes all alike, 4.5–7.0 mm long, linear, with 10–12 ribs; ribs densely covered with very fine (visible under high magnification!), light, erect, spiny hairs, less often smooth, glabrous; pappus hairs scabrous-serrate. Perennial rhizomatous plants.

704 Type of subgenus : type of genus.

Besides the species described below this subgenus includes *L. elbrusensis* (Boiss.) Czer. comb. nova (= *Crepis elbrusensis* Boiss. Diagn. pl. or. ser. 1, 11 (1849) 58), *L. frigida* (Boiss. and Bal.) Boiss., and *L. hieracioides* Boiss. and Hausskn.

1. ***L. robusta*** Czer. in Addenda XXVIII, 759.

Perennial. Rhizome woody, oblique or horizontal, sparsely covered with cord-like roots; caudex short, to 2 cm long, one-to three-headed, bearing scars or dark brown remnants of petioles of dead leaves. Stems one to three(eight), 30–50 cm high, somewhat thick, erect, straight or scarcely flexuous, cylindrical, finely sulcate, weakly branched above, less often almost from middle upward, entirely weakly arachnoid-hairy. Leaves in basal rosette numerous, somewhat thick, 4–13 cm long (including petiole), and 1.5–4.0 cm wide, oblong-oblongate, acute or subacute, deeply runcinately pinnatifid with pinnatifid or irregular sharp-toothed, divergent, rather wide lobes, attenuated into narrow-winged short petiole, broadened at the base and generally pale purple, slightly arachnoid-hairy on both surfaces weakly woolly arachnoid-hairy, sometimes subglabrous; cauline leaves strongly reduced, very small, linear, bracteiform, few, in forks of branches, less often with a more or less large leaf in the lower fork of branches similar to basal. Capitula on somewhat thick peduncles. Involucre narrowly campanulate, about 12 mm long, and 6–8 mm wide (at the beginning of flowering); involucre bracts

appressed, grayish-arachnoid-hairy; outer bracts without scarious border; inner 14–16, with scarious border (innermost), blackish-green. Florets pinkish-purple. Corolla 15–16 mm long; corolla tube about 4 mm long. Style branches green. Achenes all alike, dark reddish-brown, 6.0–6.5 mm long and 0.7–0.8 mm wide, with 10 ribs, densely covered with very fine, light, erect, spiny hairs; pappus 4.5–5.0 mm long. Flowering June to July.

Stony slopes.—*European Part*: Crimea (area between Ai-Petri and the Uchansu River, headwaters of Uchanou River, Uch-kosh Gorge, Tarakhtash). Endemic. Described from locality between Ai-Petri and Uchansu River. Type in Leningrad.

Note. It is very similar to the foothill species *L. purpurea* (Willd.) Boiss. and the “yaila” species *L. callicephala* Juz. It differs from the first species by the more robust habit of the whole plant, taller stems, slightly arachnoid-hairy or subglabrous, relatively larger leaves with rather wide and less deeply incised lobes, larger involucre, florets and achenes. It differs from the second species by closely appressed grayish-arachnoid-hairy (not densely glandular setaceous hairy) peduncles. *L. robusta* Czer. apparently is a very rare plant, replacing the more northern race of *L. purpurea* (Willd.) Boiss. in the mountain of southern Crimea.

- 705 2. *L. purpurea* (Willd.) Boiss. Fl. or. III (1875) 883.—*L. crepoides* M.B. Centur. pl. rar. Ross. merid. I (1810) t. XXX.—*L. taurica* M.B. Fl. taur.-cauc. III (1819) 539.—*Hieracium purpureum* Willd. Sp. pl. III, 3 (1803) 1560.—*Crepis purpurea* (Willd.) M.B. Fl. taur.-cauc. II (1808) 255; Bab. in Univ. Calif. Publ. Bot., 22 (1947) 622, p. p. (The Genus *Crepis*, 2).—*Intybellia rosea* Cass. in Bull. Soc. Philom. Paris (1821) 124; in Dict. Sc. nat. XXIII (1822) 548.—*I. taurica* (M.B.) Less. Synops. Comp. (1832) 144.—*I. purpurea* (Willd.) DC. Prodr. VII, 1 (1838) 180; Ldb. Fl. Ross. II, 2, 831; Stank. and Tal. Opred. Vyssh. Rast. ed. 1 696, ed. 2, 429.—*Myoseris purpurea* (Willd.) Link, Enum. pl. hort. Berol. II (1822) 291.—*Pteroptheca purpurea* (Willd.) Trautv. in Tr. Peterb. Bot. Sada, IV, 2 (1876) 386; Schmalh. Fl. II, 150; Fedtsch. and Fler. Fl. Evrop. Ross. 1047.—**lc.**: M.B. Centur. pl. rar. Ross. merid. I (1810) t. XXX (color); Bab. op. cit. fig. 187.

Perennial, Rhizome woody, oblique or horizontal, sparsely covered with cordlike roots; caudex short, 1–2 cm long, one- to four-headed, with scars of dark brown remnants of petioles of dead leaves. Stems one to five (eight), 10–30(35) cm high, more or less slender, erect or slightly ascending, straight or somewhat flexuous, cylindrical, finely ribbed, sparingly branched above, weakly arachnoid-hairy or subglabrous. Leaves in basal rosette numerous, somewhat thick, 2.5–8.0(10.0) cm long (including petiole) and 0.7–2.0(2.5) cm wide, oblanceolate, or oblong-oblanceolate, mostly acute, deeply runcinately pinnatipartite with

pinnatipartite, pinnatilobate or irregularly sharp-toothed, divergent, acute lobes, attenuated into narrow-winged petiole, broadened at the base, and (half) one-third as long as lamina, including involucre bracts and base of stem grayish strongly reduced, very small, linear, mostly bracteiform, fewer in forks of branches. Capitula on slender peduncles. Involucre cylindrical-campanulate, 9–11(12) mm long and 5–6 mm wide (at the beginning of flowering); outer involucre bracts 10–14, two-rowed, of unequal length, without scarious border; inner bracts 13–15, with scarious border (innermost), blackish-green. Florets pinkish-purple. Corolla 10–13(14) mm long; corolla tube 3.0–3.5 mm long. Style branches green. Achenes all alike, dark reddish-brown, 4.5–5.5 mm long and 0.5–0.6 mm wide, with 10 ribs densely covered with very fine, light, erect, spiny hairs; pappus about 4 mm long. Flowering June to July.

Chalk outcrops and rocks, limestone slopes.—*European Part*: Crimea (vicinity of Sevastopol, Inkerman, Chorgun, Mangup-Kale and Tepe-Kermen, Albat, Kachikalen, vicinity of Bakhchisarai, Mangush, Ak-kai Mountain near Belogorsk). Endemic. Described from Crimea. Type (neotype) in Geneva.

Note. Since Willdenow did not indicate either the type specimen or the locality from which his species originated, Babcock (l. c.), who
706 apparently, did not find type material in Willdenow's herbarium in Berlin, proposed as the neotype the plant cited in his monograph with the following label: "Crimea, Karassubazar, hills, Rehmann in 1874". In selecting the neotype he was guided by the report of Marschall-Bieberstein (M.B. l. c. 1808) regarding the occurrence of *L. purpurea* (Willd.) Boiss. in Karassubazar (now Belogorsk). Babcock had at his disposal two herbarium specimens of Rehmann, which he saw in the herbaria in Berlin and Geneva. Since the Berlin specimen is presumably lost, I consider the specimen preserved in Geneva as the neotype.

3. *L. callicephala* Juz. in Bot. Mat. Gerb. Bot. Inst. Akad. Nauk SSSR, XIV, (1951) 45, pro nom. altern.—*Intybellia callicephala* Juz. ibid.—*Pterotheca callicephala* Juz. ibid. pro nom. altern.—*Crepis callicephala* Juz. ibid. pro nom. altern.—*C. purpurea* auct. non M.B.: Babc. in Univ. Calif. Publ. Bot. 22 (1947) 622, p. min. p. (The Genus *Crepis*, 2).

Perennial. Rhizome woody, oblique or horizontal, sparsely covered with cord-like roots; caudex short, to 2 cm long, one-to-three-headed, with scars or dark brown remnants of petioles of dead leaves. Stems one to four, (15)25–60 cm high, somewhat thick, straight or slightly flexuous, cylindrical, finely ribbed, sparsely branched above, weakly arachnoid-hairy, covered in inflorescence with more or less dense, very short, yellowish, glandular hairs sometimes mixed with lax, woolly-arachnoid tomentum. Leaves in basal rosette numerous, somewhat thick, (4)5–14

cm long (including petiole) and (1.0)1.5–4.5 cm wide, oblong oblanceolate, acute or subacute, deeply runcinately pinnatipartite with pinnatilobate or irregularly sharp-toothed, divergent, rather wide lobes, attenuated into narrow-winged petioles, broadened at the base, white or pale purple, one-third to two-thirds, as long as lamina, both surfaces slightly arachnoid-hairy, weakly woolly arachnoid-hairy or subglabrous; cauline leaves woolly strongly reduced, very small, linear, bracteiform, fewer, in forks of branches, less often with more or less large leaf in lower fork of branches, like basal. Capitula on somewhat thick peduncles. Involucre narrowly campanulate, 11–13 mm long and 6–8 mm wide (at the beginning of flowering), involucre bracts more or less densely covered on outer side with mixture of short and long, mostly yellowish, glandular hairs and stiff bristles; outer involucre bracts 10–14, two-rowed, of unequal length without scarious border; inner bracts 13–14, with scarious border (innermost), blackish-green. Florets pinkish-purple. Corolla 12–15 mm long; corolla tube 3.5–4.0 mm long. Style branches green. Achenes all alike, dark reddish-brown, 5.6–6.5 mm long and about 0.6 mm wide, with 10 ribs densely covered with very fine, light, erect, spiny hairs; pappus 4.5 mm long. Flowering June to July. (Plate XXXIV, Fig. 1).

707 Rock outcrops, rubbly talus and debris, stony slopes, along edges of “yailo”. —*European part*: Crimea (Ai-Petri, sources of Lake Uchanisu, Iograf-Bogaz, Uch-Kosh Gorge, Babugan-yaila, Isar forest resthouse, Salamlar Mountain, Tarakhtash, ?Ak-Kai Mountain near Belogorsk). Endemic. Described from Babugan-yaila. Type and duplicates in Leningrad.

Note. Some specimens from the two localities (Uch-Kosh Gorge and Tarakhtash) have somewhat arachnoid-hairy peduncles and involucre bracts which are covered with sparse, long, eglandular setaceous hairs, sometimes mixed with sparse arachnoid-hairy pubescence. These plants are intermediate between *L. callicephala* Juz. and *L. robusta* Czer. and, apparently, are a hybrid of these two species. The proof in favor of the hybrid origin of the above-mentioned specimens is that in both localities they grow together with the parent species.

4. ***L. sahendi*** (Boiss. and Buhse) Czer. comb. nova.—*L. runcinata* (Trautv.) Boiss. Fl. or. Supp. (1888) 329; Lipsky, Fl. Kavk. 376; Grossh. Fl. Kavk. IV (1934) 243.—*Crepis sahendi* Boiss. and Buhse in Nouv. Mém. Soc. Nat. Mosc. XII (1860) 141; Boiss. Fl. or. III, 838; Bab. in Univ. Calif. Publ. Bot. 22 (1947) 620 (The Genus *Crepis*, 2)—*C. huetii* Boiss. Fl. or. III (1875) 838.—*Pterotheca runcinata* Trautv. in Tr. Peterb. Bot. Sada, IV 2 (1876) 385; Grossh. Opred. Rast. Kavk. 511; Asker. in Fl. Azerb. VIII, 531.—*Hieracioides sahendi* (Boiss. and Buhse) O. Ktze. Rev. gen. I (1891) 346, “*Hieraciodes*”.—**lc.**: Boiss. and Buhse, op. cit. t.

10; Bab. op. cit. fig. 186. —**Exs.:** Kotschy, It. cilic.-kurd. 1859, No. 500.

Perennial. Rhizome woody, vertical. Caudex short 0.5–3.0 cm long, one- to four-headed, covered with dark brown remnants or petioles of dead leaves. Stem solitary or few, 12–30 cm high, rather slender, erect, or slightly ascending, straight or somewhat flexuous, cylindrical, finely sulcate, branched above, with one or two arcuately erect branches terminating in single capitulum, often simple, sparsely crisped hairy over entire length, often covered with occasional crisped hairs at the base, entirely glabrous above. Leaves in basal rosette numerous, 4–12 cm long (including petiole) and 1.0–2.5 cm wide, oblanceolate, acute or subacute, runcinately deeply pinnatipartite with linear-lanceolate, mostly entire, lateral lobes and larger, oblong-lanceolate terminal lobe, gradually attenuated into narrow-winged petiole broadened at the base, glabrous or weakly pubescent with short, somewhat stiff hairs, glaucescent; cauline leaves strongly reduced, very small, linear, bracteiform, in forks of branches. Capitula one to three. Involucre narrow-campanulate, 9–11(13) mm long and 5–7 mm wide; involucre bracts densely covered with long, whitish or pale yellowish, glandular, setaceous hairs; outer involucre bracts
708 two-rowed, of unequal length, almost without scarious border; inner bracts with scarious border (innermost), blackish-green. Florets yellow. Corolla 11–13 mm long, corolla tube 3.5–4.0 mm long. Style branches yellowish. Achenes all alike, light reddish-brown, 6–7 mm long and 0.6–0.7 mm wide, with 12 thin, smooth ribs; pappus 4.5–5.0 mm long. Flowering July to August.

Subalpine mountain zone.—*Caucasus*: Southern Transcaucasia. *General distribution*: Iran (northwestern part), Armenia and Kurdistan (Surb-Khach Mountain in the former Kara District), Asia Minor (eastern part). Described from northwestern Iran. Type in Geneva; duplicate of the type in Leningrad.

Subgenus II. Petrotheca (Cass.) Czer. comb. nova.—*Crepis* auct. p. min. p. non L. M.B. Fl. taur-cauc. II (1808) 255.—*Pterotheca* Cass. in Bull. soc. Philom. Paris (1816) 200, (1821) 125; in Dict. Sc. nat. XXV, 62; XLIV, 56; XLVIII, 422; LX, 568; Benth. in Benth. and Hook. f. Gen. pl. II, 516, p. p.; O. Hoffm. in Pflanzenfam. IV, 5, 368, p. p.—*Lagoseris* auct p. p. non M.B. (1810) nec Hoffm. and Link (1820); M.B. op. cit. III (1819) 538; Boiss. Fl. or. III, 881.—*Trichocrepis* Vis. Stirp. Dalm. (1826) 18.—*Crepinia* Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1415.—*Crepis* sect. *Eucrepis* §4. *Sclerophyllae* Boiss. Fl. or. III 1875) 832, p. p.—*Crepis* sect.. *Pterotheca* (Cass.) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 215 (The Genus *Crepis*, 2).—Capitula numerous or fewer, on somewhat curved, slender peduncles. Outer involucre bracts 5–8(10), one-rowed, (half) one-fourth to one-sixth as long as inner; inner

bracts (8)10–15. Achenes heteromorphic; peripheral (outer) fewer, sometimes absent, (3.5)4.0–6.5 mm long, linear-lanceolate, with three smooth ribs (two ribs on sides and one vertical), often without pappus; middle (intermediate) mostly numerous, (3.2)3.5–5.0(6) mm long, terete, linear, with 10 ribs, densely covered with very fine (visible under a hand lens!), whitish, erect, papilliform, scaly hairs, inner achenes like middle but their ribs smooth; pappus hairs smooth. Annuals with slender virgate root.

Type of subgenus: *L. nemausensis* (Gouan) M.B.

According to Article 55 of the International Code of Botanical Nomenclature, 1959 (Russian translation), the combination *L. nemausensis* (Gouan) M.B. (and not *L. nemausensis* Gouan) Koch) should be retained for the species for which the specific epithet was used initially, even if it was erroneously applied to *L. sancta* (L.) K. Maly s. str.

5. *L. scanta* (L.) K. Maly in Glasnik zem. muz. Bosni i. Herceg. XX (1908) 556 and 562; in Dörfler, Herb. norm. Sched. ad Cent. LI and LII (1910) 36, non Thell.—*L. nemausensis* M.B. Fl. taur.-cauc. III (1819) 538, excl. auct. monnull. non Koch.—*L. bifida* (Vis.) Koch, Synops. (1837) 435; Boiss. Fl. or. III, 881, p. max. p.—*L. rueppellii* (Sch. Bip.) Sch. Bip. in Mus. Senck. (1866) 52.—*L. orientalis* Boiss. op. cit. (1875) 882, p. p.; Lipsky, Fl. Kavk. 376, p. p.—*L. caspica* Pacz. Florogr. i Fitogeodgr. Issled. Kalmytskikh Stepei (1892) 90, p. p.; Iljin in Fl. Yugo-Vost. VI, 454, p. p. “*Caspia*”.—*L. marschalliana* (Rchb.) Thell. in Mém. Soc. Nat. Sc. nat. et. meth. Cherbourg XXXVIII (1911–1912) 576, p. p. in adnot.; Grossh. Fl. Kavk. IV (1934) 243.—*L. sancta* ssp. *bifida* (Vis.) Thell. op. cit. 577.—*L. macrantha* auct. non Iljin; Stank. in Stank. and Tal. Opred. Vyssh. Rast. ed. 1, (1949) 696, p. max. p.—*Hieracium sanctum* L. Cent. pl. II (1756) 30; Amoen. Acad. IV, 328, and Sp. pl. ed. 2, 1127; Georgi, Besch. Russ. Reichs. III, 5 (1800) 1212.—*Crepis bursifolia* auct. non L.: Pall. Tabl. phys. et topogr. Taur. (1795) 57 and ed. 2 (1796) 317, nomen; Georgi, op. cit. 1214, nomen.—*C. nemausensis* auct. non Gouan: M.B. op. cit. II (1808) 255, excl. syn. nonnull.—*C. multicaulis* C. Koch in Linnaea XXIII (1850) 690, non Ldb. (1833).—*C. kochii* Tchihat. As. Min. Bot. II (1860) 374.—*C. kochiana* Boiss. op. cit. (1875) 847.—*C. sancta* ssp. *bifida* (Vis.) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 736, p. p. (The Genus *Crepis*, 2).—*C. sancta* auct. non Bab.: Nikitin in Fl. Turkm. VII (1960) 356, p. p.—*Trichocrepis bifida* Vis. Stirp. Dalm. (1826) 19.—*Crepinia marschalliana* Rchb. in Moessl. Handb. ed. 2, II, 2 (1829) 1415, in obs.: Fl. germ. excurs. I (1830) 269.—*Pterotheca nemausensis* auct. non Cass.: C.A.M. Verzeichn. (1831) 58; DC. Prodr. VII, 1, 179, p. p.—*P. bifida* (Vis.) Fisch. and Mey. Ind. Sem. hort. Petrop. IV (1837) 43; Ldb. Fl. Ross. II, 2, 831, p. p.: O. and B. Fedtsch. Perech. Rast. Turk. IV, 346, p. p.—*P. rueppellii* Sch. Bip. in Flora XXII (1839) 19.—

P. nemausensis β . *hirta* C. Koch in Linnaea, XVII (1843) 277.—*P. sancta* (L.) C. Koch, ibid. XXIII (1850) 692, p. .p. incl. α . *genuina* C. Koch. and γ . *hirta* C. Koch.—*P. bifida* var. *typica* Trautv. in Tr. Peterb. Bot. Sada, I, 1 (1871) 28, p. p. and var. *calyculosa* Trautv. op. cit. (1871) 29.—*P. obovata* var. *calyculosa* (Trautv.) Trautv. op. cit. VII, 2, (1881) 476. ?*P. falconeri* Hook. f. Fl. Brit. Ind. III (1882) 399.—*P. bifida* α . *glarescens* f. *subbiapiunata* O. Ktze. in tr. Peterb. Bot. Sada, X, 1 (1897) 204.—*P. orientalis* (Boiss.) Schmalh. Fl. II (1897) 150, p. max. p.; Fedtsh. and Fler. Fl. Evrop. Ross. 1047, p. max. p.—*P. obovata* auct. non Boiss. and Noë: ?Trautv. op. cit. IX, 2 (1886) 460; O. and B. Fedtsch. op. cit. 347, p. p. forsan solum quoad syn. (?); Pavlov, Fl. Tsent. Kazakhst. 3, 349, quoad syn. mult.; Asker. in Fl. Azerb. VIII, 532, p. p. —*P. caspica* (Pacz.) Pavl. op. cit. (1938) 349, p. p. —*P. marschalliana* (Rchb.) Dörfler, Herb. norm. Sched. ad Cent. XLII (1901) 48; Takht. and Fed. Fl. Yerevana 333; Grossh. Opred. Rast. Kavk. 511; Kolak. Fl. Abkhazii, IV, 296; Dumbadze in Fl. Gruzii, VIII, 652. —**lc.**: Vis. op. cit. t. 7.—**Exs.**: Dörfler, Herb. norm. Nos. 4163 and 5132; Baenitz, Herb. Europ. sine numero; Pl. Bulg. exs. sine numero; Pl. Bulg. exs. sine numero; Pl. Bulg. exs. cent. IV, No. 399; Fl. exs. austro-hung. No. 196; Bornm. Pl. Anatol. or. No. 2717; Huet du Pavillon, Pl. or. exs. sine numero.

Annual. Root slender, less often somewhat thick, up to 3.5 mm, hard, flexuous or curved. Stem solitary or fewer (to eight), less often numerous, (5) (10–45(60) cm high, somewhat thick, erect or arcuately ascending, cylindrical, finely ribbed, dichotomously branched above or almost from middle upward, like leaves sometimes densely or rather sparsely pubescent in the lower part with long, broadened at the base, mostly whitish, eglandular, divergent, somewhat stiff hairs, covered in the upper part, especially in inflorescence, with long, usually somewhat dark, glandular, setaceous hairs, less often glabrous. Leaves in basal rosette, (2)3–20 cm long (including petiole) and (0.8)1.0–4.5 mm wide, oblong-obovate, oblong-oblancheolate or oblancheolate, obtuse or acute, sharply sinuate-toothed, lyrate, pinnatilobate or runcinately deeply pinnatipartite with entire or toothed lobes, attenuated into narrow-winged, short or relatively long petiole broadened at the base, somewhat with more or less short, sparse stiff hairs only along margin and beneath along midrib, much less often subglabrous; light green; cauline leaves strongly reduced, very small, linear, mostly bracteiform, fewer, in fork of branches. Involucre short-cylindrical, campanulate at fruiting, 8.5–10.0(11.0) mm long and (3.0)3.5–5.0 mm wide (at the beginning of flowering); involucre bracts covered with long mostly dark, glandular, setaceous hairs on the outside along midrib, much less often glabrous (var. *hispida* (Grossh.) Czer.); outer involucre bracts 8–10, two-rowed, of unequal length, with white, narrow scarious border; inner bracts 12–15 with wide, white scarious border

(innermost). Florets yellow. Corolla 11–13 mm long, corolla tube 3.0–3.5 mm long. Style branches blackish-green. Achenes heteromorphic: peripheral (outer) whitish, 4.5–5.5 mm long and 0.5–0.7 mm wide, linear-lanceolate, with three ribs; middle (intermediate) more or less numerous, reddish brown, 4.0–4.5 mm long and about 0.4 mm wide, terete, linear, with 10 ribs densely covered with very fine, whitish, erect, papilliform scaly hairs; inner achenes like middle but with smooth ribs; pappus 4.5 mm long. Flowering April to June.

Steppe, on stony, clayey and sandy-clayey places, forest glades and dry herb slopes, rocks and talus among thickets of shrubs, old fields and weedy places; from lowlands to 1,700 (2100) m.—*European Part*: Black Sea Region (Kherson Region), Middle Dnieper (Poltava, introduced). Lower Don (south), Lower Volga (vicinity of Astrakhan, Volga River delta), Crimea; *Caucasus*: All regions; *Soviet Central Asia*: mountainous Turkmenia (Syunt Mountain, vicinity of the village of Kara-Kal, Greater Balkans), Kara-Kum (Kizyl-Atrek District, Krasnovodsk and, apparently, some other places in foothill plains of Kopetdag). *General distribution*: Balkans-Asia Minor, Syria, Palestine, Iran, Afghanistan, Baluchistan and, Indo-Himalayas (northwestern part). Described from Palestine. Type in London.

6. ***L. glaucescens*** (C. Koch) Sosn. in Beih. Bot. Centralbl. XLIV, 2
 711 (1928) 248; Grossh. Fl. Kavk. IV (1934) 243, p. p. excl. var. *hispid*
 Grossh.—*Pterotheca nemausensis* α. *glaucescens* C. Koch in Linnaea XVII
 (1843) 277.—*P. sancta* β. *glaucescens* (C. Koch) C. Koch, ibid. XXIII
 (1850) 692. —*P. bifida* var. *typica* Trautv. in Tr. Peterb. Bot. Sada, I, 1
 (1871) 28, p. min. p., IV, 1 (1876) 162.—*P. obovata* var. *leiocarpa* Trautv.
 op. cit. V, 2 (1878) 452.—*P. obovata* var. *typica* Trautv. op. cit. VII, 2
 (1881) 476.—*P. glaucescens* (C. Koch) Grossh. Oprod. Rast. Kavk. (1949)
 511.—*P. obovata* auct. non Boiss. and Noë: Asker. in Fl. Azerb. VIII
 (1961) 532, p. p.

Annual. Root slender, sometimes somewhat thick, to 3.5 mm hard, flexuous or curved. Stems two or more, less often solitary, 8–25(30) cm high, slender, erect, ascending or decumbent in the lower part, cylindrical, finely ribbed, sparsely dichotomously branched from the middle or below, glabrous or pubescent in the lower part with short, scattered, whitish, eglandular, somewhat crisped, rather soft hairs. Leaves in basal rosette, 2.5–7.0(9.0) cm long (including petiole) and 0.7–2.0 cm wide, oblong-obovate, oblong-ob lanceolate or oblanceolate, obtuse to acute, sharply sinuate-toothed or shallow pinnatilobate, attenuate into narrowly winged, short petiole, broadened at the base, with short, occasional, somewhat stiff, mostly spiny hairs along margin and beneath along midrib, less often glabrous, glaucescent; cauline leaves strongly reduced, fewer, in

forks of branches. Involucre short-cylindrical, campanulate at fruiting, 8–10 mm long and (3.0)3.5–5.0 mm wide (at beginning of flowering); involucre bracts arachnoid-woolly; outer bracts five to seven, one-rowed, mostly of unequal length, almost without scarious border; inner bracts 10–13, with wide scarious border (innermost). Florets yellow. Corolla 9–11 mm long; corolla tube about 3 mm long. Style branches yellowish. Achenes heteromorphic: peripheral (outer) whitish-yellow, 4.5–5.5(5.7) mm long and 0.5–0.7 mm wide, linear-lanceolate, with three ribs; middle (intermediate) numerous, reddish-brown, (3.5)4.0–4.5 mm long and 0.3–0.4 mm wide, terete, linear, with 10 ribs densely covered with very fine, whitish, erect, papilliform scaly hairs; inner achenes similar to middle ones but with smooth ribs; pappus about 4.5 mm long. Flowering May to June. (Plate XXXIV, Fig. 2).

Dry stony, slopes and talus, lower mountain zone.—*Caucasus*: Dagestan (Akhty), Eastern Transcaucasia (Borzhomi, Mshatsminda Mountain, Tbilisi District), Southern Transcaucasia (extreme south of Armenia, Nakhichevan ASSR, Azerbaidzhan—Zangelana District between Mindzhevan station and village of Khanlikh). *General distribution*: Armenia-Kurdistan, Iran (northwestern part). Described from Araks River valley. Type was in Berlin; duplicate of the type specimen in Leningrad.

Note. *L. glaucescens* (C. Koch) Sosn. differs from *L. sancta* (L.) K. Maly s. str. by the stem that is glabrous or pubescent below with short, scattered, eglandular, rather soft hairs, on the average much smaller leaves, 712 white arachnoid-hairy involucre bracts, and yellowish style branches.

Probably, *L. glaucescens* (C. Koch) Sosn. enters the northwestern part of Azerbaidzhan in the Mili, Mugan and Shiravan steppes in the Araks River valley where, as also in the Dzhebrail and Zangelan districts of Azerbaidzhan SSR, intermediate forms (apparently of hybrid origin) between *L. glaucescens* (C. Koch) Sosn. and *L. sancta* (L.) K. Maly s. str. are very common.

7. ***L. obovata*** (Boiss. and Noë) Bornm. in Beih. Bot. Centralbl. XX, 2 (1906) 176, p. p.; in Verh. zool.-bot. Ges. Wien LX (1910) 147, p. p.—*L. orientalis* Boiss. Fl. or. III (1875) 882, p. p.—*L. marschalliana* (Rchb.) Thell. in Mém. Soc. Nat. Sc. nat. et. meth. Cherbourg XXXVIII (1911–1912) 576, p. min. p. in adnot.—*Pterotheca obovata* Boiss. and Noë in Boiss. Diagn. pl. or. ser. II, 3 (1856) 98.—*Crepis sancta* ssp. *obovata* (Boiss. and Noë) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 741 (The Genus *Crepis*, 2).—*C. sancta* auct. non. Bab.: Nikitin in Fl. Turkm. VII (1960) 356, p. p.— **Ic.**: Bab. op. cit. fig. 240.— **Exs.**: Kotschy, Pl. Pers. austr. Nos. 50 and 247; Aucher-Eloy. Herb. Orient. No. 4878.

Annual. Root slender, hard, flexuous or curved. Stems one to four (eight), 10–35 cm high, erect or somewhat ascending, cylindrical, finely sulcate, dichotomously branched in upper part, pubescent in the lower part with long, rather dense, whitish, eglandular, divergent, somewhat stiff hairs, glabrous above, short and glandular hairy only in forks of branches. Leaves in basal rosette, 1.5–8.0(10.0) cm long (including petiole) and 0.5–1.5 cm wide, oblong-obovate or oblong-oblancheolate, obtuse to acute, finely sinuate-toothed, lyrate-pinnatifid, attenuated into narrowly winged, mostly short petiole broadened at the base covered with long scattered or relatively dense (along leaf margin) somewhat stiff hairs on both surfaces or along margin and beneath along midrib, light green; cauline leaves strongly reduced, very small, linear, bracteiform, fewer, in forks of branches. Involucre short-cylindrical, narrow-campanulate at fruiting, (7.0)7.5–9.0 mm long and 2.5–4.0 mm wide (at the beginning of flowering); involucre bracts entirely glabrous; outer five to seven, one-rowed, mostly of unequal length as also innermost bracts, with wide, white scarious border; inner bracts (8)10–13. Florets yellow. Corolla 9–12 mm long, corolla tube 3.3–5.0 mm long. Style branches yellowish. Achenes heteromorphic; peripheral (outer) achenes usually absent; middle (intermediate) achenes more or less numerous, greenish-reddish brown or brown, 3.2–4.0(4.3) mm long and 0.3–0.4 mm wide, terete, linear, with 10 ribs densely covered with very fine, whitish, erect, papilliform, scaly hairs; inner achenes similar to middle one, but reddish-brown, and with smooth ribs; pappus 4.0–4.5 mm long. Flowering May.

Talus.—*Soviet Central Asia*: mountainous Turkmenia (Central Kopetdag—Nukhur, Kelyat Range, Chuli gorge, Firyuzin gorge). *General distribution*: Iran (Iran, Baluchistan, ?Afghanistan, Asia Minor (eastern part), north of Saudi Arabia, Syria, Palestine, Sinai Peninsula, lower reaches of the Nile. Described from Asia Minor. Type in Geneva.

Note. In the type specimen, illustrated in Babcock's work (l. c.), the involucre bracts are shown to be covered with occasional setaceous hairs.

8. *L. macrantha* (Bge.) Iljin in Izv. Glavn. Bot. Sada XXVI (1927) 416, descr. lat. compl.; in Fl. Yugo-Vost. VI, 435; Stank. and Tal. Opred. Vyssh. Rast. ed. 2, 429, p. min. p.—*L. orientalis* auct. non Boiss.; Fedtsch. and Kraschen. Rast. Turk. Obl. (1910) 254.—*Pterotheca bifida* auct. non Fisch. and Mey.; Ldb. Fl. Ross. II, 2 (1846) 831, p. min. p.—*P. macrantha* Bge. Beitr. Kenntniss Russl. Steppe. Centr. As. (1851) 208, descr. manca in adnot. ad *P. aralensem* Bge.: in Mém. Acad. Sc. Pétersb. div. sav. VII (1854) 384; Pavlov, Fl. Tsentr. Kazakhst. 3, 348. —*P. bifida* var. *typica* Trautv. in Tr. Peterb. Bot. Sada, I, 1 (1871) 28, p. p. quoad. pl. astrachanicam.—*P. orientalis* (Boiss.) Schmalh. Fl. II (1897) 150, p. min. p.; Fedtsch. and Fler. Fl. Evrop. Ross. 1047, p. min. p.—*P. obovata* auct. non Boiss. and Noë: O. and B. Fedtsch. Perech. Rast. Turk. IV (1911)

347, p. p.; Pavlov, op. cit. 349, p. p.—*Crepis sancta* ssp. *bifida* (Vis.) Babc. in Univ. Calif. Publ. Bot. 22 (1947) 736, p. min. p. (The Genus *Crepis*, 2). Ic.: Iljin in Fl. Yugo-Vost. VI (1936) Fig. 717.

Annual. Root slender, hard, flexuous, or curved. Stems one to six (nine), 7–30(40) cm high, mostly somewhat thick, erect, or ascending, cylindrical, finely sulcate, dichotomously branched in the upper part, sometimes from the middle upward, glabrous or pubescent in the lower part with short, occasional, whitish, eglandular setaceous hairs. Leaves in basal rosette, 1.5–7.5(9.0) cm long (including petiole) and 0.5–2.0 cm wide, obovate, oblong-obovate, less often oblong-ob lanceolate, obtuse, much less often acute, sinuate-toothed or shallow pinnatilobate, attenuated into narrow-winged, short petiole broadened at base, glabrous or with very short and occasional spiny hairs along margin, rarely on both surfaces glaucescent; cauline leaves strongly reduced, very small, linear, mostly bracteiform, fewer in forks of branches. Capitula in lax corymb, on slender, usually somewhat curved peduncles. Involucre short-cylindrical, cup-shaped or campanulate at fruiting, 9–10(11) mm long and 4–5 mm wide (at the beginning of flowering); involucre bracts densely covered with
714 more or less short, thin, glandular, mostly whitish hairs; outer bracts five to seven, one-rowed, almost of equal length, without scarious border, inner bracts 12–13, with rather wide, scarious white border (innermost). Florets yellow. Corolla 11–13 mm long; corolla tube 3.0–3.5 mm long. Style branches yellowish. Achenes heteromorphic; peripheral (outer) achenes whitish-yellowish, 3.5–5.0 mm long and 0.6–0.8 mm wide, linear-lanceolate, with three ribs; middle (innermost) achenes numerous, reddish-brown, (3.5)4.0–4.5 mm long and about 0.4 mm wide, terete, linear, with 10 ribs densely covered with very fine, whitish, erect, papilliform scaly hairs; inner achenes like middle but with smooth ribs; pappus 4–5 mm long. Flowering June to July.

Clayey alkaline soil and gypsiferous slopes.—*European Part*: Lower Volga (Greater Bodgo and Arzargar mountains, vicinity of Astrakhan, near village of Zamyany, Enotaev District); *Soviet Central Asia*: Aralo-Caspian (southern part of former Irghy District and southward to Kuvan-Darya River). Endemic. Described from area between Malibash and Aigirak Bay and from Kuvan-Darya River. Type in Paris.

9. *L. aralensis* (Bge.) Boiss. Fl. or. III (1875) 882.—*L. marschlliana* (Rchb.) Thell. in Mém. Soc. Nat. Sc. nat. et. meth. Cherbourg XXXVIII (1911–1912) 576, p. min. p. in adnot.—*Pterotheca bifida* auct. non. Fisch. and Mey.: Kar. and Kir. in Bull. Soc. Nat. Mosc. XV (1842) 400 (Enum. pl. Songor. 131); Ldb. Fl. Ross. II, 2, 831, p. min. p.; O. and B. Fedtsch. Perech. Rast. Turk. IV, 346, p. p. excl. var.—*P. aralensis* Bge. Beitr. Kenntniss Russl. Stepp. Centr.-As. (1851) 207; in Mém. Acad. Sc. Pétersb.

div. sav. VII (1854) 383; O. and B. Fedtsch. op. cit. 347; Pavlov, Fl. Tsentr. Kazakhst. 3, 349.—*P. bifida* α . *glaucescens* O. Ktze. in Tr. Peterb. Bot. Sada, X, 1 (1887) 204, p. p. excl. f. *subbipinnata* O. Ktze. non *P. nemausensis* α . *glaucescens* C. Koch.—*P. obovata* auct. non Boiss. and Noë: O. and B. Fedtsch. op. cit. (1911) 347, p. p.—*Crepis sancta* ssp. *bifida* (Vis.) Bab. in Univ. Calif. Publ. Bot. 22 (1947) 736, p. min. p. (The Genus *Crepis*, 2).—*C. sancta* auct. non Bab.: Nikitin in Fl. Turkm. VII (1960) 356, p. p.—**lc.**: Bab. op. cit. 238.

Annual. Root slender, hard, flexuous or curved. Stems fewer or rather numerous, less often solitary, 5–25 cm high, erect or ascending, cylindrical, finely sulcate, dichotomously branched in the upper part or from middle, pubescent in the lower part with very short, occasional, whitish, eglandular, setaceous or almost spiny hairs, usually glabrous above, sparsely covered in inflorescence, sometimes only below capitula with short glandular hairs, less often entirely short glandular hairy. Leaves in basal rosette, more or less thin, 1.2–6.0(10.0) cm long (including petiole) and 0.5–1.5(2.0) cm wide, oblong-obovate or oblong-lanceolate, mostly obtuse, finely sinuate-toothed to lyrate, less often pinnatifid, attenuated into narrow-winged, short petiole broadened at the base, glabrous, often covered on both surfaces or only along margin with very short, scattered, setaceous or almost spiny hairs, glaucescent; cauline leaves strongly reduced, extremely small, linear, mostly bracteiform, fewer, in forks of branches. Capitula in lax corymbose inflorescence, on slender, usually somewhat curved, peduncles. Involucre cylindrical, narrow-campanulate at fruiting, 10–12 mm long and 3–4 mm wide (at the beginning of flowering); involucre bracts with occasional, short, glandular, whitish or reddish-brown, somewhat stiff hairs, often subglabrous above; outer bracts five or six, one-rowed, almost of equal length, as also the innermost, with wide, white scarious border; inner bracts 8–10. Florets yellow. Corolla 10–11 mm long; corolla tube about 3 mm long. Style branches yellowish. Achenes heteromorphic: peripheral (outer) achenes whitish-yellowish, (4.5)5.0–6.5 mm long and 0.5–0.7 mm wide, linear, with three ribs; middle (intermediate) achenes fewer, sometimes absent, greenish-reddish-brown, less often reddish-brown, 4.5–6.0 mm long and about 0.4 mm wide, terete, linear, with 10 ribs covered with dense, fine, whitish, erect, papilliform, scaly hairs; inner achenes similar to middle ones but reddish-brown or dark reddish-brown, more strongly narrowed above, ribs smooth and not reaching achene apex; pappus 4.5–5.5 mm long. Flowering April to May.

Sandy and clayey deserts, foothill plains, rubbly slopes of relict ridges and foothills.—*Soviet Central Asia*: Aralo-Caspian (southeastern part), Syrdarya, Balkhash Region (south), Kyzyl-Kum, Kara-Kum, mountainous Turkmenia (vicinity of Ashkhabad, Kazandzhik, Greater Balkhans), Pamiro-Alai (Urmitan and Iori in the Zeravshan River valley). Endemic.

Described from Kyzyl-Kum (area between Southern Kuduk and Bakali, old bed of Yana-Darya River, Aral steppe). Type in Paris.

GENUS 1675. *Zacintha* Mill. ^{1, 2}

Mill. Gard. Dict. e. 4 (1754).

Capitula with many florets, solitary, pedunculate or sessile. Involucre two-rowed; outer involucre bracts smaller, inner one and one-half to two times as long as outer, hardening with fruits, deflexed and overlapping peripheral achenes by their bases. Receptacle glabrous. Corolla yellow. Achenes dimorphic; peripheral laterally compressed, strongly curved in the upper part and attenuated into beak; middle achenes terete, without beak; pappus hairs scabrous from spinules, shedding. Annual herbs with oblongly obovate lower leaves and sessile, basally sagittate cauline leaves.

A monotypic genus.

- 716 1. *Z. verrucosa* Gaertn. De Fruct. et semin. II (1791) 358; MB. Fl. taur.-cauc. III, 541; DC Prodr. VII, 178; Ldb. Fl. Ross. (1845–1846) 830; Boiss. Fl. or. 829; O. Hoffm. in Pflanzenfam. IV, 1 (1894) 360.—*Lapsana zacintha* L. Sp. pl. (1753) 811.—*Ic.*: Sibth. and Sm. Fl. Graeca, t. 280.

Annual. Stem simple or dichotomously branched, 5–30(50) cm high glabrous in the upper part or weakly hairy, more or less sparsely hairy in the lower part. Basal leaves sinuate-toothed to lyrate pinnatifid, on wide petiole, scatteredly hairy; cauline leaves lanceolate or oblong-lanceolate, fewer, toothed. Capitula terminal (at apices of stem and branches) on long peduncles; capitula in the lower part of lateral branches short peduncles or sessile. Ligules yellow, one and one-half times as long as involucre; inner involucre bracts at fruiting hardened, in the lower part and cucullate, completely overlapping the outer (peripheral) achenes by their edges; upper part of inner bracts, ligulate, attenuated and bent first inward toward center of capitulum, later rising vertically upward; convergent and upward-bent tips of involucre bracts much softer, green and herbaceous. Achenes long-obovate, light reddish-brown with 10 thin longitudinal ribs, 2.5–3.0 mm long; outer (peripheral) achenes curved in the upper part at right angle and with beak, inner achenes straight. Flowering May to June.

Stony and rubbly slopes, sometimes as weed.—*European Part*: Crimea (southern coast). *General distribution*: Mediterranean, Balkans-Asia Minor. Described from Italy. Type in London.

¹ Treatment by I.T. Vassilchenko.

² Named after Zacynthus Island where this plant was collected by Sibthorp.

DIAGNOSES PLANTARUM NOVARUM IN TOMO XXIX
FLORAE URSS COMMEMORATARUM
(Latin Diagnoses of New Species Included in Vol. XXIX)

March, 1964

SCORZONERA L.

Subgenus *Podospermum* (DC.) Lipsch.

1. Series. 1. Laciniatae Lipsch.—Plantae biennes caulibus evolutis foliatis. Achenis cylindrica glabra.

Seriei typus: *S. Laciniata* L.

2. Series 2. Armeniaca Lipsch.—Plantae perennes. Achenia saepe pilosa dimorphaque: externa—dilatata et alata, interna—tenuiora aptera.

Seriei typus: *S. armeniaca* (Boiss. et. Huet) Boiss.

3. Series 3. Schischkinianae Lipsch.—Plantae perennes. Collum radice pluriceps. Caules evoluti foliati. Calathidia minuta (ca. 8 mm lata in florescentia). Achenia glabra cylindrica.

In declivibus praemontanis distributae.

Seriei typus: *S. Schischkinii* Lipsch. et Vass.

4. *S. Schischkinii* Lipsch. et Vass. sp. n.—*Podospermum Schischkinii* Vass. in Gross. Opred. Rast. Kavk. (1949) 508, descr. ross.

Rhizoma crassum pluriceps; tota planta subglabra vel praesertim in parte inferiore paulo arachnoidea; caules (10)15–25 cm alt., numerosi, tenues virgati, ramosi, foliati; folia pinnatisecta, basalia et caulina inferiora numerosa, petiolata, petiolis in vaginas dilatatis; radice collum vaginis petiolorum vetustorum dense restitum; segmenta foliorum lateralia non numerosa plus minusve elongata angusta (1 mm lat.); folia caulina superiora diminuta, sessilia, integra basi duplo dilatata vix semiamplexicaulia. Calathidia numerosa ad apices caulis et ramorum solitaria anguste cylindrica minuta, 10–15 mm long., 3–4 mm lat. (in florescentia); involucri griseo-tomentosum, phyllariis externis elongato-

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ovatis, internis oblongo-lanceolatis duplo longioribus; flores ligulares lutei, involucro paulo longiores, ligulae profunde fissae subfimbriatae; achenia 9–10 mm long. glabra anguste cylindrica costulata, basi clavulata paulo curvata, stipite 1.5–1.75 mm long; pappus sordide albus achenium aequans setis plumosis. Fl. VI–VII.

718 Habitat in lapidosis super mare Nigrum.

Typus: Caucasus prov. Krasnodar prope urbem Anapa in valle Sukko VII (1938) n° 50, leg. E. Czerniakowska; in herbario Inst. Bot. Ac. Sc. URSS conservatur.

Affinitas. A. *S. Idae* (Sosn.) Lipsch. rhizomate crasso pluricipite, caulibus virgatis 15–25 cm long., calathidiis numerosis (10–20) anguste cylindricis 10–15 mm long., 3–4 mm lat. in florescentia differt.

5. Series 4. Grossheimianae Lipsch.—Plantae perennes caulibus evolutis Radicis collum vaginis petiolorum vetustorum vestitum. Achenia anguste cylindrica longa, ca. 16 mm long.

Plantae in regione montana media distributae.

Seriei typus: *S. Grossheimii* Lipsch. et Vass.

6. *S. Grossheimii* Lipsch. et Vass. sp. n.—*Podospermum Grossheimii* Vass. in Grossh. Opred Rest. Kavk. (1949) 509, descr. ross.—*Scorzonera Grossheimii* (Vass.) Lipsch. ex Isaev in Fl. Azerb. VIII (1961) 519, descr. ross.

Perennis, Planta paulum araneoso-pubescens, tardius denudata, radice pluricipite; caules numerosi, recti vel ascendentes, tenues, in parte inferiore ramosi, (15) 20–25 cm, alti; folia pinnatisecta praesertim basalia et in parte inferiore caulis aggregata, segmentis lateralibus paucis distantibus linearibus vel lineari-lanceolatis, angustis ca. 1 mm lat.; segmento terminali elongato; folia basalia et caulina inferiora longe petiolata, petiolis in vaginas stramineo-brunnescentes, radice collum tegentes dilatatis; folia caulina diminuta, solitaria, integra, anguste linearia sessilia. Calathidia anguste cylindrica ad apices ramulorum solitaria 4–5 mm lat. (in florescentia) demum fructificatione latiora (ca. 1 cm lata); involucrum griseo-pubescens tardius subglabrum, phyllariis oblongo-lanceolatis vel lanceolatis, exterioribus saepe apice appendicibus corniculatis praeditis, interioribus duplo-triplo vel ultra longioribus; flores ligulares lutei; achenia (11)12–15(16) mm longa, glabra laevia anguste cylindrica griseo-brunnea longitudinaliter costata basi stipite cavo lucido achenio quadruplo minore; pappus sordide albus setis plumosis, nonnullis longioribus apice serrato-scabridis. Fl. VI–VII.

Habitat in declivibus apricis Caucasi.

Typus: Prov. Talysch, in declivitatibus glareosis montis Sibirdu, 9 VII 1931, n° 733, leg. N. Schipczinsky; in herbario Inst. Bot. Ac. Sc. URSS. conservatur.

Affinitas. *A. S. armeniaca* (Boiss. et Huet) Boiss. acheniis longioribus, segmentis lateralibus foliorum duplo-triplo angustioribus sat differt.

7. Series 5. Canae Lipsch.—Perennes. Achenia basi obliqua dilatataque cylindrica, exteriora latiora, interiora-angustiora.

Plantae praemontanae et in planitiibus adjacentibus distributae.

Seriei typus: *S. cana* (C.A.M.) O. Hoffm.

719 8. Series 6. Alpigenae Lipsch.—Plantae caespitulosae. Caules scapiformes foliis non numerosis diminutis. Folia praecipue basilaria. Calathidia 1.5–2.5 cm long. in florescentia. Phyllaria exteriora appendicibus corniculatis vulgo praedita. Achenia anguste cylindrica glabra. In regione altimontana Caucasi distributae.

Seriei typus: *S. Meyeri* (C. Koch) Lipsch.

9. ***S. Kirpicznikovii*** Lipsch. sp. n.; Issaev in Fl. Azerb. VIII (1961) 520, descr. ross.-*Podospermum canum* C.A.M. Verzeichn. (1831) 62 quoad pl. talysch.; DC. Prodr. VII, 1, 110 excl. β. *glabratum* et. pl. talysch.- *P. tenuisectum* Grossh. et. Sosn. in Zam. po Sist. i Geogr. Rast. Tbil. 13 (1947) 67, quoad pl. talysch.

Perennis, Planta canescenti-grisea; radices collum vaginis vetustis foliorum radicalium vestitum; vaginae rigidae nitidulae partim vix fissae; caules scapiformes 6–12(15) cm long. simplices vel rarissime in parte superiore ramosi et tum calathidiis duobus praediti, pubescentes, aphylli vel foliis solitariis instructi, folia radicalia subduplo superantes; folia praesertim basalia numerosa, griseo-pubescentia ca. 8 cm long., pinnatisecta segmentis lateralibus numerosis linearibus angustis (1–1.5 mm lat.), segmento terminali elongato anguste lineari; folia caulina in numero 2–3 abbreviata vel absentia. Calathidia ad 1.5 cm long. (ligulis inclusis) in florescentia, 1.8–2 cm long. in fructificatione; involucrium plus minusve pubescens, pubescentia demum interdum evanescente; phyllaria exteriora minora triangulata vel triangulato-lanceolata apice saepe corniculis ornata, interiora oblongo-lanceolata exterioribus duplo et ultra longiora; flores ligulares sulphurei, in sicco roseoli; achenia anguste cylindrica, 7–8(10) mm long., laevia, glabra, longitudinaliter costulata, stipite cavo brevi suffulta; pappus sordide albus setis plumosis apice serrulato-scabridis.

Habitat in pratis alpinis talyschensibus.

Typus: In campis subalpinis provinciae Talyschensis, 7 Junii 1830, leg. C.A. Meyer; in herb. Inst. Bot. AC. Sc. URSS. In Leningrad conservatur.

Affinitas. A. *S. Meyeri* (C. Koch) Lipsch. cui affinis, pubescentia cana, calathidiis minoribus, ca. 1.5 cm long. in florescentia differt.

10. Series 7. Molles Lipsch.—Radix tuberiformis apud superficiem terrae vel profundius disposita. Caules plus minusve alti, sulcati, vulgo denseque ad apicem foliati, Flores ligulares lutei.

Seriei typus: *S. mollis* M.B.

11. Series 8. Leptophyllae Lipsch.—Caules scapiformes humiles inferne foliati raro foliis solitariis praediti nunquam dense foliati. Tubera nuciformia ovata vel fusiformia, vulgo apud superficiem disposita. Flores ligulares lutei vel rubri.

Seriei typus: *S. leptophylla* (DC.) Krasch. et. Lipsch.

Subgenus Scorzonera

12. Series 9. Macrospermae Lipsch.—Flores ligulares lutei.

Seriei typus: *S. albicaulis* Bge.

720 13. Series 10. Bracteosae Lipsch.—Calathidia foliis bracteiformibus suffulta. Folia late vel ovato-lanceolata, 2.5–4 cm lat.

Seriei typus: *S. bracteosa* Winkl.

14. Series 11. Tragopogonoideae Lipsch.—Calathidia follis bracteiformibus non suffulta. Folia linearia graminoida ca. 2 cm lat. Flores ligulares rosei.

Seriei typus: *S. tragopogonoides* Rgl. et Schmalh.

15. Series 12. Subacaulis Lipsch.—Plantae plus minusve pubescentes, subacaulis vel caules humiles pubescentes scapiformes. Calathidia magna ca. 5 cm long. Phyllaria plus minus pubescentia.

Plantae alpinae.

Seriei typus: *S. subacaulis* Lipsch.

16. Series 13. Austriacae Lipsch.—Plantae glabrae. Caules distincte evoluti, glabri, Phyllaria glabra.

In regionibus stepposa, silvatico-stepposa et silvatica distributae.

Seriei typus: *S. austriaca* Willd.

17. Series 14. Filifoliae Lipsch.—Caules scapiformes, pauci. Folia angusta, filiformi-linearia. Radicis collum vaginis foliorum vetustorum non dense vestitum. Achenia glabra vel pubescentia.

Seriei typus: *S. filifolia* Boiss.

18. Series 15. Rigidae Lipsch.—Caules scapiformes, altiores, numerosi stricti. Radicis collum vaginis induratis dense vestitum. Folia linearia, angusta.

Seriei typus: *S. rigida* Auch. ex. DC.

19. Series 16. Koslovskyanae Lipsch.—Caules scapiformes, distincte foliati. Folia lanceolata. Pappi setae rubiginosae.

Seriei typus: *S. Koslovskyi* Sosn.

20. Series 17. Parviflorae Lipsch.—Radicis collum non incrassatum. Caules simplices foliis uno-tribus squamiformibus, calathido uno raro duobus praediti.

Seriei typus: *S. parviflora* Jacq.

21. Series 18. Mongolicae Lipsch.—Radicis collum propter vaginas vetustas induratasque plurimas foliorum radicalium incrassatum. Caules ramosi, foliati, calathidiis non multis (usque ad sex) praediti.

Seriei typus: *S. mongolica* Maxim.

721 22. Sectio 9. Turkestanicae Lipsch.—Caules erecti vulgo valde ramosi, foliati. Folia linearia vel late lanceolata. Calathidia in racemo disposita, multiflora vel. pauciflora. Involucrum multiseriale. Flores ligulares lutei vel aurantiaci. Achenia cylindrica, glabra, costata, Pappus sordide albus totaliter caducus, setis plumosis 5–10 longioribus apice serrulatis.

Sectionis typus: *S. turkestanica* Franch.

23. Series 19. Franchetianae Lipsch.—Folia radicalia caulinaque lata, ovato-elliptica vel late lanceolata.

Seriei typus: *S. Franchetii* Lipsch.

24. Series 20. Pauciflorae Lipsch.—Calathidia anguste cylindrica, pauciflora. Phyllaria in numero 12–15.

Seriei typus: *S. turkestanica* Franch.

25. Series 21. Racemosae Lipsch.—Calathidia late cylindrica multiflora. Phyllaria in numero 20–32.

Seriei typus: *S. iliensis* Krasch.

26. Sectio 15. **Foliosae** (Boiss.) Lipsch. comb. n.—subsectio (§) *Foliosae* Boiss. Fl. or. III (1875) 756.—Folia pubescentia vel glabra. Caules foliati saepe alti. Achenia exteriora costis tuberculatis vel squamato-aciculatis.

Seriei typus: *S. stricta* Hornem.

27. Series 22. Strictae Lipsch. Folia linearia.

Seriei typus: *S. stricta* Hornem.

28. **S. gracilis** Lipsch. sp. n.

Perennis. Tota planta ob pubescentiam e pilis plurimis stellatis canescenti-tomentella; radix cylindrica, collo reliquiis varinarum rigidarum fuscarum foliorum emortuorum et vagrinarum hyalinarum foliorum vegetorum vestito; caules 15—20 cm alti, stricti vel paulo ascendentes, simplices aut parum ramosi; folia anguste linearia valde pubescentia; radicalia—2—4 mm lat. saepe longitudinaliter plicata apice subulata basi glabra vaginaliter dilatata, caulina—diminuta, pauca, sessilia vix semiamplexicaulia; folium supremum solitarium, saepe ad calathidium appropinquatum bracteiforme apice attenuatum longe aristatum. Calathidia solitaria vel in numero 2—5, magna, 2.5—3 cm long., 7—8 mm lat. in florescentia; involucrum canescenti-tomentellum phyllariis exterioribus ovatis vel triangulari-ovatis, interioribus oblongo-lanceolatis, margine membranaceis exteriora subduplo superantibus, omnibus plus minusve acuminatis; flores ligulares rosei (in sicco lilacini) subduplo involucrum superantes: achenia matura incognita, juvenilia costis vix muriculatis; setae inaequilongae plumosae serrulato scabridae. Fl. V.

Habitat in schistosis Asiae Mediae.

Typus: Pamir, Chorog, in vicinitate Horti Botanici, 27 V 1943, G. Nepli; in Herb. Inst. Bot. Ac. Sc. URSS. in Leningrad conservatur.

Affinitas. A. *S. pubescente* DC. pubescentia albo-tomentosa floribusque roseis valde differt.

29. Series 23. Hispanicae Lipsch.—Folia ovato-lanceolata vel lanceolata.

Seriei typus: *S. hispanica* L.

Sectio 11. **Polycladae** DC.

30. Series. 24. Acanthocladae Lipsch.—Suffrutices sphaerici vulgo caulibus vetustis annotinis multis praediti, Caules ramulis sterilibus partim acicularibus muniti; folia caulina abbreviata linearia subulata. Calathidia anguste cylindrica pauciflora.

Seriei typus: *S. acanthoclada* Franch.

31. Series 25. Divaricatae Lipsch.—Suffrutices vel plantae perennes caulibus acicularibus annotinis destitutae. Caules sine ramulis sterilibus; folia caulina distincte evoluta.

Seriei typus: *S. pseudodivaricata* Lipsch.

Sectio 13. **Papposae** Lipsch. et. Krasch.

32. Series 26. Darvasicae Lipsch.—Caules alti usque ad apicem foliati, Internodia elongata. Calathidia anguste cylindrica.

Seriei typus: *S. tadshikorum* Krasch. et. Lipsch.

33. Series 27. Ferganicae Lipsch.—Caulis scapiformis a parte mediana ramosus, caules floriferi numerosi, folia prope ramificationem aggregata. Internodia abbreviata. Calathidia anguste cylindrica.

Seriei typus: *S. ferganica* Krasch.

34. Series 28. Ovatae Lipsch.—Calathidia late cylindrica. Flores ligulares lutei vel rosei (in sicco violacei). Achenia compresso-cylindrica, jugata. Folia radicalia et caulina inferiora ovata vel lanceolata margine undulato-crispata vel plana.

Seriei typus: *S. ovata* Trautv.

Sectio 15. **Nervosae** Lipsch.

35. Series 29. Sosnovskyanae Lipsch.—Pubescentia densa lucida (velutina). Venatio folii propter pubescentiam recondita. Folia margine non undulata Achenia glabra vel pubescentia.

Seriei typus: *S. sosnovskyi* Lipsch.

36. Series 30. Latifoliae Lipsch.—Pubescentia minus densa opaca (non velutina), planta interdum subglabra valde nervosa. Folia margine undulato-crispata cartilaginea. Calathidia numerosa. Inflorescentia paniculata. Achenia pubescentia vel glabra (plantae in Asia Minore tantum distributae acheniis glabris praeditae).

Seriei typus: *S. latifolia* (Fisch. et Mey.) DC.

Sectio 16. **Vierhapperia** Lipsch.

37. Series 31. Biebersteinianae Lipsch.—Caules ascendentes vel erect non virgati. Folia rigida venis praecipue prominentibus apice acuminata.

Calathidia multiflora (supra quam 20); achenia 1–7 mm long. (pappo excluso).

723 *Seriei typus: S. Biebersteinii* Lipsch.

38. Series 32. *Ramosissimae* Lipsch.—Caules virgati stricti. Folia molliora apice acumine deficiente. *Calathidia pauciflora*, floribus in numero 6–7. Achenia 9–10 mm long (pappo excluso).

Seriei typus: S. ramosissima DC.

Sectio 17. *Tuberosae* Lipsch.

39. Subsectio 1. *Lanatae* Lipsch.—Caules simplices.

Subsectionis typus: *S. lanata* (L.) Hoffm.

40. Subsectio 2. *Tuberiferae* Lipsch.—Caules ramosi.

Subsectionis typus: *S. tuberosa* Pall.

41. Series 33. *Nutantes* Lipsch.—Pedunculi nutantes. Folia molliora venis parum prominentibus.

Seriei typus: S. tuberosa Pall.

42. Series 34. *Erectae* Lipsch.—Pedunculi erecti. Folia rigida venis prominentibus.

Seriei typus: S. gageoides Boiss.

TRAGOPOGON L.

43. Sectio 2. *Kemularia* Boriss. sect. n.—Pedunculi valde incrassati; involucri phylla in numero 8; *Calathidia magna*; flores lutei involucri phyllis breviores; acheniorum rostra ca. 2 mm long. curvata laevia apice clavato-incrassata, achenium subito dilatatum profunde sulcatum costis prominentibus scabridis; pappus achenio (cum rostro) brevior; plantae biennes.

Sectionis typus: *T. kemulariae* Kuthath.

44. Sectio 5. *Krascheninnikovia* Boriss. sect. n.—series *Robusti* Kutath. Kavk. Predct. Tragop. (1957) 38, p. p.—Pedunculi erecti sub capitulo paulo incrassati; *calathidia magna*, 6–8 cm long. cylindrica, involucri phylla in numero 7–8, raro 12 floribus multo longiora; flores atro-violacei vel atro-purpurei; achenia majora rostris tenuibus curvatis sensim dilatata tenuiter sulcata et acute tuberculata; plantae biennes.

Sectionis typus: *T. krascheninnikovii* S. Nikit.

45. **T. badachschanicus** Boriss. sp. n. (sect. *Tragopogon*).

Biennis. Radix robusta elongata verticalis; radicis collum vaginis foliorum vetustorum vestitum; planta glabra; caules 15–35 cm erecti a basi ramosi; folia inferiora numerosa linearia, basi dilatata 0.5–1.5 cm lat. semiamplexicaulia, ad apicem subito angustata longè acuminata plicataque pedunculos non excedentia 7–20 cm long.; folia intermedia inferioribus multo majora linearia vel lanceolata semiamplexicaulia venis numerosis, margine interdum albo-limitata; pedumculi foliis excedentes
724 fructificatione sub capitulo incrassati. Calathidia in florescentia ca. 2 cm long. 1 cm lat., fructificatione 3.5–5 cm long. polysperma; involucri phylla in numero 8(9), in florescentia floribus subaequalia, fructificatione acheniis aequalia vel ea paulo superantia, viridia, lineari-lanceolata sensim acuminata; flores pallide lutei, in sicco pallide violacei; achenia marginalia parum curvata 2.6 cm long. (cum pappo 4.3 cm); achenii pars dilatata ca. 1.3 cm long. pentagona tenuiter sulcata, scabra subito angustata rostro ca. 2 cm long. apice non dilatato annulo puberulo praedioto; pappus ca. 1.7 cm long., pallide aureus in parte superiore brunnescens, achenio (cum rostro) brevior. Fl. VII.

Habitat in declivibus stepposis altimontains.

Typus: Asia Media montes Pamir, in loco Kok-Dshar dicto, 25 VIII 1897, leg. S. Korshinsky; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. A. *T. turkestanico*. S. Nikit. caulibus a basi ramosis inferne dense foliatis, involucri phyllis floribus subaequalibus, acheniis paulo longioribus differt.

46. Sectio 9. **Bessera** Boriss. sect. n.—Pedunculi superne non incrassati paulo foliis excedentes; calathidia praesertim minora et mediocria; involucri phylla in numero (7)8 vel 8–12 floribus acheniisque breviora; flores lutei vel pallide lutei; achenia tenuia laevia vel paulo scabra apice angustata rostro obsoleto 1.5–3 mm long. pappi acheniis paulo breviores; plantae perennes (raro biennes) floccoso-tomentosae in florescentia, interdum caespitosae, simplices vel ramosae dense foliatae; radicis collum vaginis foliorum vetustorum vestitum; folia angusta vel filiformia. Arenicola.

Sectionis typus: *T. lithuanicus* (DC.) Boriss.

47. Sectio 11. **Sosnovskya** Boriss. sect. n.—Pedunculi sub capitulo non incrassati; calathidia mediocria vel magna, 3.5–5 cm long; involucri phylla in numero 8 floribus breviora acheniis marginalibus aequalia; flores magnilutei aurantiaci vel pallide lutei; achenia magna erecta albida sensim angustata, rostro incrassato, interdum indistincte evoluto, achenii parti dilatatae subaequali. Plantae perennes raro biennes radicibus incrassatis cylindricis.

Sectionis typus: *T. reticulatus* Boiss. et Huet.

48. Sectio 12. **Dubjanskya** Boriss. sect. n.—Pedunculi sub capitulo valde incrassati; calathidia magna, 5–6 cm long. solitaria pedunculosa; involucri phylla in numero 8–12; flores lutei; achenium rostro crasso brevi 3 cm long; pappus achenio subaequalis; plantae biennes robustae arenicolae.

Sectionis typus: *T. sabulosus* Krasch. et S. Nikit.

49. Sectio 13. **Dasypogon** Boriss. sect. n.—Pedunculi non incrassati; calathidia numerosa, 3–3.5(4) cm long; involucri phylla in numero 5, raro 6, puberula floribus acheniisque paulo breviora: flores pallide lutei in sicco pallide violacei; achenia in numero 5 rostro deficiente incrassata
725 sulcata tuberculataque; pappus achenium paulo superans; plantae perennes vel biennes a basi ramosae brachiatae.

Sectionis typus: *T. kopetdaghensis* Boriss.

50. Sectio 14. **Nikitinia** Boriss. sect. n.—series Dasyrhynchiformes Artemez. in Uchen. Zap. Chernov. Univ. I, (1948) 89 p. p.—Pedunculi non incrassati; calathidia mediocria 20–45 mm long. numerosa inflorescentiam paniculatam formantia; involucri phylla in numero (7)8–12; flores lutei; achenia crassiuscula rostro deficiente vel crasso brevique; pappus achenio subaequalis; plantae biennes caulibus ramosis flexuosisque, arenicolae.

Sectionis typus: *T. Dubjanskyi* Krasch. et S. Nikit.

51. Sectio 15. **Chromopappus** Boriss. sect. n.—Pedunculi sub capitulo clavato-incrassati breves; calathidia magna; involucri phylla in numero 6–8, flores subduplo superantia; flores purpurei rosei vel violacei; achenia rostro erecto crassiusculo laevi; pappus sordide violaceus achenio subaequalis. Plantae biennes.

Sectionis typus: *T. coloratus* C.A.M.

52. Sectio 17. **Hebecarpus** Boriss. sect. n.—Pedunculi sub capitulo incrassati cavi; involucri phylla in numero 8, raro 5, flores superantia vel eis aequalia; calathida 5–8 cm long.; flores purpurei vel violacei; achenia marginalia erecta fusca rostro crassiusculo erecto sensim angustata, achenii pars dilatata squamato-tuberculata rostro subaequalis; pappus achenio subaequalis. Plantae magnae biennes vel annuae.

Sectionis typus: *T. porrifolius* L.

53. PARAMICRORHYNCHUS Kirp. gen. nov.

Calathidia homogama, 15–30 flora, plus minusve cylindrica, apice

vel secus ramulos solitaria vel congesta. Involucris (3) 4–5 serialis phylla imbricata, margine paleacea. Achenia biformia: exteriora brunnea vel grisea costulis longitudinalibus prominulis sat numerosis praedita, ad basin truncata, apice triangulariter angustata, rostro tenui, vix conspicuo, facillime deciduo terminata, interiora prismatico-cylindrica, flavida, sulcis longitudinalibus profundis paucis (plerumque 5) donata, vix transverse rugosa vel levia; in calathidio quovis achenia formam intermediam praebentia adsunt. Pappus e pilis numerosis tenuibus sericeis albis vix denticulatis (sub lente!) in anulum coalitis constans.

Typus generis—*Paramicrorhynchus procumbens* (Roxb.) Kirp.

Genus adhuc monotypicum, regionis mediterraneae occidentalis et orientalis, necnon Afghanistanae, Indiae et Kaschgariae incola; intra limites USSR in Asia Media occurrit. Lomatolepidi Cass. affine est, sed acheniis exalatis bene differt. A Microrhyncho, genere adhuc obscuro, structura acheniorum quoque distinguitur.

CEPHALORRHYNCHUS Boiss.

726 54. Sectio 2. **Zollikoferiastrum** Kirp. sect. nov.—Caules a basi furcatim ramosi, fructificatione fere aphylli, Calathidia apice ramulorum (Pedunculo rum) longorum tenuium solitaria. Achenia pallida, rostro brevi obscuro terminata.

Typus sectionis—*Cephalorrhynchus polycladus* (Boiss) Kirp.

CICERBITA Wallr.

55. Subgen. II. **Platyachaena** Kirp. subgen. nov.—Achenia lanceolata vel lineari-elliptica, plus minusve compressa ad plana vel complanato-triangularia, saepissime atro-violacea, costulis longitudinalibus plus minusve numerosis, rarius uno-paucis ab utroque latere praedita, per totam superficiem pilis brevissimis, haud raro in seribus transverse undulatis dispositis vestita, apice in collum latum attenuata.

Typus subgeneris—*Cicerbita uralensis* Beauverd.

Nomen subgeneris ob formam achenii datum.

56. Sectio 1. **Platyachena** Kirp. sect. nov.—Achenia plus minusve compressa vel complanato-triangularia, ab uno saltem latere costa longitudinali mediali bene conspicua praedita, per totam superficiem pilis brevissimis (sub lente!) in seriebus transverse undulatis dispositis tecta.

Typus sectionis—typus subgeneris.

57. Sectio 2. **Prenanthopsis** Kirp. sect. nov.—Achenia compressae triangulata vel valde compressa ad plana, costulis longitudinalibus numerosis plus minusve aequalibus praedita.

Typus sectionis—*Cicerbita prenanthoides* (M.B.) Beauverd.

58. Sectio 3. **Multicostaria** Kirp. sect. nov.—Achenia plana saepe vix asymmetrica, costulis longitudinalibus subaequalibus numerosis praedita, apice angustata, quasi collum formantia. Pappus exterior optime evolutus (qua nota a ceteris speciebus subgeneris *Platyachenae* differt).

Typus sectionis—*Cicerbita deltoidea* (M.B.) Beauverd.

59. *Subgen.* III. **Poicilachena** Kirp. subgen. nov.—Achenia anguste vel oblongo-elliptica, ochracea vel brunnea, maculis atro-violaceis notata, plus minusve compressa vel non compressa, costulis, longitudinalibus omnibus bene conspicuis, sat numerosis praedita, per totam superficiem pilis brevibus (sub lente) tecta, apice in collum breve angustata, disco lato pappigero, pappo exteriori vix conspicuo, interiore e pilis facillime deciduis constituto terminata. Calathidia pauciflora (Plerumque 5-, raro 6 and 8-flora), corollae flavae vel roseae. Species montium Asiae mediae incolae.

Typus subgeneris—*Cicerbita zeravschanica* M. Pop. ex Kovalevsk. Nomen subgeneris ob colorem achenii datum.

60. **LAGOSERIOPSIS** Kirp. gen. nov.

Calathidia homogama, pauciflora (4–6-flora), parva, anguste cylindrica vel anguste obconico-cylindrica, apice ramulorum filiformium solitarie disposita. Involucrum plerumque biseriale. oligophyllum. Achenia 727 biformia: exteriora pappo facillime deciduo, cylindrico-prismatica, dense pubescentia; interiora pappo persistente, vix puberula ad glabra.

Typus generis—*Lagoseriopsis Popovii* (Krasch.) Kirp.

Plantae annuae, desertorum incolae, caulibus furcatim ramosis, tenuibus, oligophyllis insignes.

Genus monotypicum, cuius species unica in genera *Launaea* primum descripta erat, quamquam structura acheniorum ea nec *Launaeae* sed *lagoseris* in mentem revocat; posterior tamen receptaculo longe paleaceo necnon pappo alieno differt. A genere dubio *Heterachaena* (si vis accipere) planta nostra acheniis cylindrico-prismaticis (nec oblongo-ellipticis plus minusve compressis apice rostratis) necnon structura pappi bene differt, etiamsi habitu *lagoseriopsis Popovii* m. *Heterachaenae massauensi* Fresen. similis est.

YOUNGIA Cass.

61. Sect. **Pseudo-Ixeridopsis** Czer. sect. n.—Planta perennis,

glaberrima (interdum involucri phylla sparse setoso-pilosa); radix plus minusve tenuis; caudex simplex vel subramosus, brevis, 0.3–2 cm lt., reliquiis foliorum radicalium vetustorum vestitus; caules in numero 1–2(3), a medio vel a basi remote ramosi, ramis longis; folia radicalia vulgo lanceolata vel oblanceolata, sinuato-dentata, pinnatilobata vel runcinato-pinnatipartita, lobis vel laciniis triangularibus vel linearibus, praecipue integerrimis, raro integerrima, petiolata, petiolis brevibus alatis, caulina non numerosa, sesilia, caulina inferiora radicalibus similia, caulina media et superiora valde diminuta, anguste linearia, integerrima vel ut apicalia bracteiformia. Calathidia mediocria, 4–9(11)-flora, inflorescentiam corymbosam patentem formantia; involucri phylla exteriora interioribus triplo-quintuplo breviora, late ovata vel oblongo-ovata, obtusa; receptaculum laeve, glabrum; corolla 13–20 mm lg., tubo glabro 2.5–4.5 mm lg.; achenia immatura flavida vel brunnea, 7–9 mm lg. et 0.7–1 mm lat., fusiformia, dorso compressa, superne leviter angustata, apice discoideo-dilatata, costulata (ut videtur costulis in numero 10–12, inaequicrassis), glabra; pappus pallide rufescens, 7–7.5 mm lg., pilis rigidiusculis non deciduis.

Typus sectionis: *Y. serawschanica* (B. Fedtsch.) Bab. et Stebbins.

PARAIXERIS Nakai

62. Sect. **Pseudomycelis** Tzvel. sect. nova.—Calathidia vulgo quinqueflora; involucri phylla interiora (4)5(6); achenia costis longiuscule papillosa.

Typus sectionis: *P. chelidoniifolia* (Makino) Nakai.

LAPSANA L.

628 63. **L. aipetriensis** Vass. sp. nova.—Planta perennis caulibus numerosis tenuibus 10–25 sm lg. Folia inferiora lyrato-pinnatisecta segmento acrantho trigono sinuato-dentato, segmentis lateralibus minoribus ovatis pilis simplicibus et glandulosis tectis. Folia caulina sessilia lanceolata. Calathidia in inflorescentia paniculata cylindrica 7–9 mm lg., 2–3 mm lt. pedunculis tenuibus glandulosis vel nudis. Involucri phylla externa ovata breviora; phylla interna longiora linearia glaucescentia nuda vel pilis uniserialibus dorso obsita. Flores ochroleuci (in sicco sordide ochroleuci) involucrum subduplo superantes.

Habitat in declivibus montanis Tauriae meridionalis.

Typus: Tauria, Jalta prope summitatem montis Ai-Petri: In Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. Ab omnibus speciebus nostris generis *Lapsana* calathidiis angustioribus, caulibus humilioribus et colore glauco differt.

TARAXACUM Web.

Sectio 2. *Taraxacum*Subsectio 1. *Gymnophylla* Hand-Mazz.64. **T. almaatense** Schischk. sp. nova.

Radix sat crassa, verticalis, collo residuis fuscescentibus foliorum emortuorum vestito; folia sat numerosa, 10–30 cm longa, 1–5 cm lata, glabra vel vix araneosa, runcinatim pinnatipartita, laciniis lateralibus horizontaliter patentibus vel retrorsis, longe acuminatis, terminali sat magna, inter lacinias denticulis longe acuminatis sparsis, apice in acumen abeuntibus praedita; scapi 2–6 foliis pro more subaequilongi, subglabri vel sub calathidiis plus minusve araneosi; involucri 13–18 mm longi phylla exteriora plus minusve squarrosa, interioribus latiora, ovata vel ovato-lanceolata, viridia, ecorniculata, interiora exterioribus longissimis plerumque sesqui longiora, oblongo-linearia, viridia, apice atro-viridia, ut exteriora ecorniculata. Flores flavi, corollis in parte media copiose longe pilosis, marginales ligulis subtus stria obscura notatis; achenia pallide fusca, parte dilatata 3–3.5 mm longa, in dimidio superiore muriculata; pyramis ca. 0.5 mm longa; rostrum sat tenue 7–8 mm lg.; pappus 6–7 mm longus, albus. Fl. Majo-Junio.

Habitat in pratis, pratulis silvaticis et ad vias.

Species Asiae Mediae (Tjan-Schan) endemica.

Typus: Viciniae opp. Alma-Ata, prope pagum Remisovka 26 V 1934 L. Kuprianova; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypi ibidem.

65. **T. turgaicum** Schischk. sp. nova.

Planta 8–25 cm alta; radix sat crassa, haud raro multiceps, collo glabro vel vix piloso; folia 8–17 cm longa, 1.5–4 cm lata, vix glaucescentia, subglabra, plerumque runcinatim pinnatipartita, laciniis lateralibus ab utroque latere 3–5 plus minusve retrorsis, margine anteriore interdum dentatis, terminali sat magna, exteriora interdum pinnatilobata, vel etiam integra, margine sinuato-dentata: scapi 2–6, sub calathidiis tantum vix araneosi; involucri 13–18 mm longi vix glaucescentis phylla exteriora ovata vel ovato-lanceolata, plus minusve appressa, vel pro parte plus minusve squarrosa, interioribus multo latiora et sat magna, pallide viridia, margine vix membranacea, in parte superiore obscuriora, ecorniculata vel
729 corniculis subinconspicuis praedita; interiora oblongo-linearia, exterioribus longissimis sesqui longiora, viridia, sub apice obscuriora, pro more ecorniculata. Flores flavi, corollis in parte media copiose longipilosis,

marginales ligulis subtus stria lata obscura notatis; achenia pallide fusca, parte dilatata ca. 2.5 mm longa, sulculis sat numerosis non profundis exarata, dimidio superiore muriculata, infra fere ad basin acutiuscule et obtuse tuberculata; pyramis ca. 0.8 mm longa; rostrum 8–11 mm longum; pappus ca 5 mm longus, albus,. Fl. Majo-Junio.

Habitat in pratis humidis plerumque subsalsuginosis.

Species Sibiriae occidentalis et Asiae Mediae (regionis Aralo-caspicae) endemica.

Typus: Regio Aktjubinsk inter lacus Tumaly-Kul 8 VI 1927, n° 101, O. Knorring et N. Belov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypi ibidem.

66. **T. majus** Schischk. sp. nova.

Radix sat crassa, saepe multiceps; folia 15–35 cm longa, 2–5 cm lata, subglabra, integra, margine irregulariter grosse dentata vel runcinatim pinnatipartita, laciniis ab utroque latere 2–4 latis, plus minusve retrorsis, terminali multo majore; scapi tempore florendi foliis subsequilongi, sub calathidiis vix araneosi; involucri 15–20 mm longi phylla exteriora late ovata ad ovato-lanceolata, plus minusve appressa, fructificatione plus minusve squarrosa, interioribus multo latiora, atro-viridia vix glaucescentia, margine angusto albido-membranaceo praedita, ecorniculata vel corniculis subinconspicuis praedita, interiora oblongo-linearia, exterioribus longissimis sesqui-duplo longiora, ecorniculata vel corniculis subinconspicuis praedita. Flores flavi corollis in parte media breviter pilosis; achenia pallide flavido-fusca, parte dilatata 3–3.5 mm longa, sulcis paucis exarata, in triente superiore muriculata; pyramis 0.6–0.8 mm longa; rostrum 7–10 mm longum; pappus 6–7 mm longus, albus. Fl. Majo-Junio.

Habitat in pratis, declivibus herbosis, in Lasiagrostidetis regionis montanae mediae et inferioris praecipue.

Species Asiae Mediae incola.

Typus: Kazachstan, distr. Kegenj, ad pedem montis Labassa 30 VI 1936, n° 37, collector ignotus; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

67. **T. macrolepium** Schischk. sp. nova.

Planta 8–30 cm alta; radix sat crassa, verticalis; folia 10–25 cm longa, 2–6 cm lata, sparse pilosa ad subglabra, vulgo runcinatim pinnatipartita vel pinnatilobata, laciniis vel lobis lateralibus horizontaliter patentibus vel vix retrorsis, margine superiore saepe plus minusve dentatis, terminali multo majore, dentibus intermediis irregulariter dispositis in acumen plus minusve longum attenuatis; scapi sat crassi, sub calathidiis plus minusve araneoso-tomentosi; involucri 13–17 mm longi phylla exteriora a

730 lanceolata-ovatis ad late lanceolata, plerumque plus minusve squarrosa ad reflexa, interioribus sublata, herbaceo-membranacea, pallide viridia, margine membranaceo lato albido cincta, ecorniculata, interiora oblongo-linearia, exterioribus longissimis vulgo 1.5-plo longiora, viridia ecorniculata vel subinconspectue corniculata. Flores flavi vel pallide flavi (?), marginales ligulis subtus stria obscura lata notatis, corollis in parte media sparse breviter vel longius pilosis; achenia pallide flavido-fusca, parte dilatata 3.5–4 mm longa, triente vel dimidio superiore muriculata, sulcis longitudinalibus paucis exarata; pyramis 0.5–0.7 mm longa; rostrum 11–13 mm longum; pappus ca 8 mm longus, albus, Fl. Junio-Julio.

Habitat in pratis, in declivibus herbosis regionis montanae mediae. Species ut videtur Transcaucasiae australis incola.

Typus: Turcia. Viciniae opp. Sarykâmysch; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur. Isotypus ibidem.

68. Subsectio 2. **Alpina** Schischk. subsect. nova.-Plantae mediocres vel humiles, altimontanae Julio-Augusto florentes. Radix sat crassa, collo glabro, Scapi glaberrimi, rarius subglabri. Involucri phylla ecorniculata, exteriora plus minusve numerosa, appressa, rarius plus minusve squarrosa ad reflexa, interiora exterioribus longissimis vulgo duplo longiora. Flores flavi. Achenia pallide fusca, parte dilatata 3.5–5 mm longa, parte superiore muriculata, apice sat abrupte, rarius sat sensim in pyramidem 0.5–0.7 mm longam abeuntia; rostrum 5.5–8 mm longum, parte achenii dilatata semper plus quam 1.5-plo longius.

Typus subsectionis: *T. alpinum* Hegetschr. et Heer.

Subsectio 4. *Ceratophora* Hand.-Mazz.

69. **T. murmanicum** Orlova spec. nova.

Radix sat crassa, pluriceps; folia 10–20 cm longa, 2–7 cm lata, breviter et sparse pilosa, apice acuminata, pinnatilobata vel pinnatipartita, lobis vel laciniis lateralibus sat angustis plus minusve retrorsis; scapi plerumque pauci, glaberrimi, fructificatione foliis multo longiores; involucri 18–22 mm longi viridis phylla exteriora ab ovatis ad late lanceolata, inferne haud raro plus minusve dentata, plerumque plus minusve squarrosa fructificatione ad reflexa, sub apice corniculata, interiora oblongo-linearia. Flores flavi, corollis in parte media longe pilosis; achenia fuscidula, parte dilatata ca 4 mm longa, superne sat dense muriculata; pyramis ca 0.5 mm longa; rostrum tenue, ca 13 mm longum; pappus 8–9 mm longus, albus. Fl. Junio-Augusto.

Habitat in arenis maritimis.

Species ut videtur peninsulae Kolaënsis endemica.

Typus: Regio Murmanica, peninsula Piscatorum, sinus Lausch, 26

VIII 1955, N. Orlova et alii; in Herb. Horti Botanici Arcto-alpini filiae Kolaënsis Ac. Sc. URSS in Kirovsk conservatur.

Huius speciei descriptionem a cl. Orlova benevole missam recepi.

Subsectio 5. Macrocornuta (Van Soest) Schischk.

70. *T. glaucivirens* Schischk. spec. nova.

731 Planta 8–20 cm alta; radix sat crassa, collo residuis fuscidulis foliorum emortuorum vestito, in axillis plus minusve laxe tomentello; folia 5–12 cm longa. 1–25 cm lata, glabra vel subglabra, glaucescenti-viridia, runcinatum pinnatipartita vel pinnatilobata, lobis vel lanciniis plus minusve retrorsis saepe margine dentatis; scapi sub calathidiis parce laxe araneoso-tomentelli, infra plerumque glabri; involucri sub anthesi 10–16 mm longi glaucescenti-viridis phylla sub apice plerumque distincte sed sat breviter corniculata, exteriora a late ovatis ad late lanceolata, interioribus vix latiora plerumque appressa, margine membranaceo sat lato bene limitato cincta, interiora oblongo-lineararia, exterioribus longissimis 2–2½-plo longiora. Flores pallide flavi vel albidus (?) corollis in parte media sparse breviter pilosis, ligulis subtus stria obscura notatis; achenia pallide fusca, parte dilatata 3.5–4 mm longa, triente superiore sat parce muriculata; pyramis 1–1.5 mm longa, bene limitata; rostrum 7–9 mm longum; pappus ca 8 mm longus, albus Fl. Junio-Julio.

Habitat in declivibus lapidosis et saxis regionis montanae superioris.

Species Asiae Mediae (Pamiro-Alai) endemica.

Typus: Declivitas australis jugi Hissarici, in angustis fl. Kondara, in systemate fl. Varsob, planities elata Rundascht, 20 VII 1945, n° 832, V. Pissjaukova; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

71. *T. alatavicum* Schischk. spec. nova.

Radix sat crassa (in parte superiore 5–10 mm crassa) verticalis, collo residuis atro-fuscis foliorum emortuorum vestito; folia sat numerosa, 8–20 cm longa, 2–4 cm lata, glabra vel vix araneosa, runcinatum pinnatipartita, laciniis acutis triangularibus retrorsis, margine saepe plus minusve dentatis, terminali sat parva; scapi plerumque foliis sublongiores, solitarii vel pauci, sat crassiusculi, glabri, sub calathidio tantum vix araneosi; involucri ca 15 mm longi phylla exteriora plus minusve squarrosa, oblonga vel. oblongo-lanceolata, atro-viridia, margine membranaceo angustissimo cincta, sub apice subinconspicue corniculata vel ecorniculata, interiora exterioribus longissimis plerumque 2–2.5 plo longiora, oblongo-lineararia, viridia, margine membranaceo angusto cincta, sub apice obscuro manifeste corniculata. Flores flavi (?), marginales ligulis subtus stria lata violacea notatis; achenia pallide fusca, costata, parte dilatata ca 3.5–4 mm longa, fere ad basin dense muriculata; pyramis 0.7–

1 mm longa; rostrum sat tenue, 6.5–8 mm longum; pappus 5.5–6.5 longus, albus. Fl. Majo-Junio.

Habitat in declivibus lapidosis et glareosis ad vias.

Species Asiae Mediae (regionis Balchaschensis et Alatau Songorici) incola.

Typus: Pars occidentalis Alatau Songorici, mons Czulak prope pagum Czingildy, 27 V 1955, V. Goloskokov; in Herb. Inst. Bot. Ac. Sc. URSS. in Leningrad conservatur.

72. T. Juzepczukii Schischk. spec. nova.

732 Planta 15–30 cm alta; radix sat crassa, verticalis, collo residuis atrofusci foliorum emortuorum vestito, subglabro; folia 10–25 cm longa, 2.5–7 cm lata, glabra vel subglabra, runcinatim pinnatipartita, laciniis lateralibus plus minusve retrorsis, longe acutatis margine superiore plus minusve dentatis, terminali sat parva; scapi plerumque parvi, sub calathidiis vix araneosi; involucris sub anthesi 13–17 mm longi phylla exteriora plus minusve appressa interioribus sat latiora ab ovatis ad late lanceolata, pallide viridia, margine plus minusve membranacea ecorniculata vel breviter corniculata, interiora oblongo-linearia, exterioribus longissimis 2.5–plo longiora, glaucescenti-viridia, sub apice haud semper distincte breviter corniculata vel ecorniculata. Flores flavi corollis in parte media breviter et longe pilosis, marginales ligulis subtus stria obscura notatis; achenia pallide fusca, parte dilatata ca 3 mm longa, sulcis longitudinalibus sat paucis exarata, in dimidio superiore sat dense muriculata, infra breviter obtuseque tuberculata; pyramis 0.8–1.2 mm longa; rostrum 8–11 longum; pappus 6–7 mm longus, albidus. Fl. Aprili-Majo.

Habitat in pratis, hortis et viridariis ad vias, in oppidis.

Species Asiae Mediae (opp. Taschkent) endemica.

Typus: Opp. Taschkent, Tachtakul, in foro scholae medicae, 29 IV 1932, A. Lapin; in Herb. Inst. Bot. Ac. Sc. Uzbekistanicae in Taschkent conservatur; isotypi in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservantur.

73. T. Botschantzevii Schischk. spec. nova.

Radix sat crassa, collo residuis atro-fusci foliorum emortuorum vestito, in axillis parce laxe fuscescenti-tomentello; folia 4–12 cm longa, 1–2.5 cm lata, secus nervum medium parce pilosa, runcinatim pinnatipartita vel pinnatilobata, lacinia terminali multo majore, laciniis vel lobis laterelibus sat paucis longe acutatis interdum pro parte integra sinuato-dentata; scapi pauci plerumque plus minusve ascendentes, foliis subaequilongis, superne praecipue plus minusve laxe araneoso-tomentelli; involucris 10–14 mm longis viridis phylla exteriora a lanceolato-ovatis ad lanceolata, plus minusve squarrosa (ad reflexa), interioribus subaequilata,

sub apice ecorniculata vel breviter obtuse corniculata, interiora oblongo-lineararia, exterioribus longissimis 2.5–3 plo longiora, sub apice manifeste atro-corniculata. Flores flavi corollis in parte media sparse breviter pilosis; ligulis subtus stria lata obscura notatis; achenia pallide fusca, parte dilatata ca 2.5 mm longa, triente superiore sat parce muriculata; pyramis ca 0.8 mm longa; rostrum 7–8 mm longum; pappus ca 6 mm longus albus. Fl. Majo-Junio.

Habitat in pratis, in glareosis ad vias.

Species Asiae Mediae (Tajan-Schan, Jugum Karatau) endemica.

Typus: Kazachstania australis, jugum Karatau, via a pago Bajdzhonssaj ad pagum Czolaktau ducens, in prato apud fl. Koktal 18 VI 1959, n° 445. V. Botschantzev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

74. **T. praecox** Schischk. spec. nova; Schischk. in Lapin, Opred. Rast. Tashkentsk. Oazisa (1938) 316, descr. ross.-*T. monochlamydeum* Hand. Mazz. Monogr. Tarax. (1907) 43 p. p.; Kovalevskaya in Fl. Uzbek. VI 469 p. p.

733 Planta 5–15 cm alta; radix sat tenuis, collo residuis fuscidulis foliorum emortuorum sat paucis vestito, in axillis pilis flexuosis longis paucis praedito folia glabra vel subglabra, 5–15 cm longa, 8–20 mm lata, profunde pinnatipartita, laciniis lateralibus sat numerosis, ad basin plus minusve angustatis, margine saepe dentatis, lacinulis ac dentibus intermediis multo minoribus, lacinia terminali majore; scapi sub calathidiis parce araneosi, plerumque subglabri; involucris 10–12 mm longi, atroviridis phylla exteriora ab ovatis ad lanceolato-ovata, plus minusve appressa, interioribus subaequilonga vel sublatiora, margine plus minusve membranacea, ecorniculata, interiora oblongo-lineararia, exterioribus longissimis 3–3.5-plo longiora, ecorniculata vel indistincte corniculata. Flores pallide flavi, marginales ligulis subtus stria obscura notatis. Achenia ignota. Fl. Februario-Martio.

Habitat in declivibus arenosis et argillosis in hortis, ad vias.

Species Asiae Mediae (opp. Taschkent) endemica.

Typus: Hortus stationis agriculturae prope opp. Taschkent, 11 II 1903, collector ignotus; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypi ibidem et in Taschkent.

Affinitas. *A. T. monochlamydeo* Hand-Mazz. foliorum forma, involucro obscuro nigrescenti necnon tempore florendi praecoci differt.

75. **T. holophyllum** Schischk. spec. nova; Schischk. in Lapin, Opred. Rast. Tashkentsk. Oazisa (1938) 316 descr. ross.-*T. monochlamydeum* Hand.-Mazz. Monogr. Tarax. (1907) 43. p. p.; Kovalevskaya in Fl. Uzbek. VI, 469 p. p.

Planta 4–12 cm alta; radix sat crassa; folia glabra vel subglabra 3–8 cm longa, 8–18 mm lata, integra, margine plus minusve sinuato-dentata ad integerrima, apice, obtusa; scapi 2–3 sub calathidiis plus minusve araneosi; involucri 9–12 mm longi atro-viridis phylla exteriora a lanceolato-ovatis ad late lanceolata, plus minusve appressa, vel pro parte reflexa, ecorniculata, interiora oblongo-lanceolata, exterioribus longissimis $2\frac{1}{2}$ –3-plo longiora, ecorniculata vel indistincte corniculata. Flores pallide flavi; achenia ignota. Fl. Martio-Aprili.

Habitat in argillosis, in hortis ac viridariis ad vias.

Species Asiae Mediae (opp. Taschkent) endemica.

Typus: Territorium stationis experimentalis olitorio-hortensis nom. cl. Schrederi prope opp. Taschkent; collector ignotus; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus in Taschkent.

Affinitas. A proximo *T. monochlamydeo* Hand.-Mazz. foliis integris margine plus minusve dentatis vel integerrimis necnon involucris atro-viridibus subnigris differt.

76. *T. nuratavicum* Schischk. spec. nova.

734 Planta 5–16 cm alta; radix sat crassa, haud raro pluriceps, collo residuis fuscescentibus foliorum emortuorum vestito, in axillis parce fuscescenti-tomentello; folia 5–12 cm longa, 1.5–3 cm lata, glaucescenti-viridia, pilis flexuosis plus minusve dispersa ad subintegra, runcinatum pinnatipartita, laciniis lateralibus plus minusve retrorsis, saepe ad marginem anteriorem dentatis, dentibus 2–4 ab utroque latere praeditis, terminali eis multo majore; scapi sparse araneosi sub calathidiis laxo araneoso-tomentelli; involucri 9–14 mm longi phylla exteriora a late lanceolatis ad lanceolata, plus minusva squarrosa (ad reflexa) et interioribus plerumque subangustiora, herbaceo-membranacea, pallide viridia, ecorniculata, interiora oblongo-lineararia, plerumque phyllis exterioribus longissimis 2.5 plo longiora, viridia, sub apice brevissime subinconspicue corniculata vel ecorniculata. Flores flavi vel pallide flavi(?), corollis in parte media breviter pilosis, marginales ligulis subtus stria lata obscura notatis; achenia pallide fusca, parte dilatata ca 3.5 mm longa, sulcis longitudinalibus paucis exarata, dimidio vel triente superiore muriculata; pyramis 0.6–0.8 mm longa, bene limitata; rostrum 7–8 mm longum; pappus 5–6 mm longus, albus, Fl. Majo-Junio.

Habitat in declivibus lapidosis et argillosis glareosis ad pratula regionis montanae mediae et superioris.

Species Asiae Mediae endemica.

Typus: Jugum Nuratau, montes, Aktau, Tutak 4 VI 1951, n° 103, O. Neustrueva et. L. Zvetkova; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

77. **T. tadshikorum** Ovcz. spec. nova; Ovczinnikov in Soobshch. Tadzh. Fl. Akad. Nauk SSSR 1 (1947) 3, descr. ross.

Radix sat crassa, haud raro pluriceps, collo residuis fusciscentibus foliorum emortuorum vestito, in axillis parce laxe fusciscenti-tomentello; folia 10–20 cm longa, 2–3.5 cm lata, ad basin in petiolum anguste alatum attenuata, viridia, subglabra, integra, margine irregulariter sinuato-dentata; scapi 3–8, 8–25 cm longi, tenues, sub calathidiis tantum pilis flexuosis paucis praediti; involucri 12–18 mm longi phylla exteriora a late ovatis ad lanceolato-ovata, plus minusve reflexa, interioribus sublatis, lucide viridia, angustissime membranace-omarginata, distincte reticulata, sub apice ecorniculata vel vix corniculata, interiora oblongo-linearia, exterioribus longissimis plerumque 2.5 longiora, viridia, sub apice vulgo pro parte vix corniculata, pro parte ecorniculata. Flores flavi, corollis in parte media breviter sparse pilosis, marginales ligulis subtus stria lata obscura notatis; achenia pallide fuscido-viridia, parte dilatata ca 2.5 mm longa, sulcis longitudinalibus paucis exarata, triente superiore sat longe muriculata, infra parce tantum breviter ac obtuse tuberculata; pyramis 0.8–1 mm longa rostrum 8–11 mm longum; pappus ca 5 mm longus, albus; Fl. Aprili-Augusto.

Habitat in declivibus lapidosis atque argillosis regionis montanae inferioris et mediae.

Species Asiae Mediae (Pamiro-Alaj) endemica.

Typus: Tadzhikistania, jugum Hissaricum, distr. Schachrinau; Schomalik. 1600 m.s.m. 10 VII 1947, P. ovczinnikov. et M. Nadyrov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

78. **T. karatavicum** Pavl. spec. nova; Pavl. in Pavl. and Lipsch. in Sov. Bot. 1 (1934) 29, nom. nud.

735 Planta 10–35 cm alta; radix sat crassa, collo residuis atro-fuscis foliorum emortuorum vestito, in axillis tomentulo fusciscente e pilis flexuosis longis plus minusve copiose praedito; folia subglabra, 10–25 cm longa, 1.5–3.5 cm lata, petiolis sat longis anguste alatis, vulgo integra, margine sinuato-dentata, rarius pinnatilobata vel etiam pinnatipartita, lobis plus minusve retrorsis, margine saepe dentatis; scapi pauci, sub calathidiis tantum parce laxe araneoso-tomentosi; involucri sub anthesi 12–15 mm longi glaucescenti-viridis phylla exteriora a lanceolato-ovatis ad lanceolata, plus minusve squarrosa, ad reflexa, interioribus subaequilata, sed tenuiora, sub apice ecorniculata vel breviter subinconspicue corniculata, interiora oblongo-linearia, plerumque exterioribus longissimis 2.5–plo longiora, sub apice breviter sed distincte corniculata. Flores flavi vel pallide flavi, corollis in parte media breviter pilosis, marginales, ligulis subtus stria lata obscura notatis; achenia pallide fusca, parte dilatata 2.5–2.8 mm longa, dimidio superiore sat dense muriculata, infra brevius obtuse tuberculata;

pyramis ca 0.6 mm longa, ab utroque latere bene limitata; rostrum 9–10 mm longum; pappus ca 6 mm longus, albus, Fl. Aprili-Majo.

Habitat in pratis, declivibus lapidosis ac glareosis.

Species Asiae Mediae (jugum Karatau) endemica.

Typus Montes Karatau, declivitas sub cacumine Bakujtau 1 VII 1931 n° 478 W. Pavlov; in Herb. universitatis Mosquaensis; isotypus in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

79. **T. longipyramidatum** Schischk. spec. nova.

Planta 10–40 cm alta; radix sat crassa, verticalis; folia 12–25 cm longa, 3–6 cm lata, glabra vel subglabra, integra margine sinuato-inaequidentata ad pinnatipartita, laciniis lateralibus latis margine plus minusve dentatis, terminalieis majore; scapi pauci sub calathidiis tantum pilis flexuosis paucis ornati; involucris sub anthesi 13–18 mm longi phylla exteriora primo plus minusve appressa, dein (ad finem anthesis) plus minusve squarrosa, ad reflexa, ab ovatis ad lanceolato-ovata, interioribus plerumque sublatis, vix glaucescenti-viridia, ecorniculata vel indistincte corniculata, interiora oblongo-linearia, exterioribus longissimis plerumque duplo longiora, sub apice ecorniculata vel brevissime obtuse corniculata. Flores flavi corollis in part media copiose sed breviter pilosis, maginales ligulis subtus stria lata obscura notatis; achenia pallide flavido-fusca, partedilatata ca 3 mm longa, a basi tuberculata, superne muriculata, inferne obtuse tuberculata; pyramis 1.2–1.8 mm longa; rostrum 8–10 mm longum; pappus ca 7 mm longus, albus. Fl. Majo.

Habitat in pratis subsalsuginosis in Lasiagrostidetis.

Species Asiae Mediae (regionis Balchaschensis et promontiorum borealium montium Tjan-Schan) endemica.

Typus: Regio Alma-Atensis prope stationem Czemolgan 28 V 1932 A. Geld; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

80. **T. longirostre** Schischk. spec. nova.

736 Planta 10–25 cm alta; radix sat crassa, interdum pluriceps; folia 6–15 cm longa, 7–25 mm lata, viridia vix glaucescentia, subglabra, ab integris marginesinuato-inaequidentatis ad pinnatipartita, laciniis lateralibus plus minusve retrorsis margine saepe dentatis, terminali multo majore margine dentata; scapi pauci, sub calathidiis pilis flexuosis paucis ornati; involucris 12–16 mm longi phylla exteriora ab ovatis ad late lanceolata, plus minusve squarrosa ad relex, interioribus pro more sublatis, pallide, virida, ecorniculata vel inconspicue corniculata, interiora oblongo-linearia, exterioribus longissimis vulgo duplo longiora, viridia, sub apice indistincte corniculata vel ecorniculata. Flores flavi; achenia pallide fusca, parte dilatata ca 3.5 mm longa, dimidio superiore muriculata, infra parce tantum obtuse tuberculata; pyramis

ca 1 mm longa; rostrum 8–11 mm longum; pappus 5–6 mm longus, albus, Fl. Junio-Julio.

Habitat in pratis subsalsuginosis regionis montanae mediae et superioris.

Species Asiae Mediae (Pamiro-Alaj, partis occidentalis) endemica.

Typus: Declivitas australis jugi Hissarici; loca ripae dextrae fl. Kafiringan adjacentia; systema fl. Dzjurjaz 1.5 km ad septentrionem a tractu Darvaz 20 VII 1939, n° 115, K. Afanassiev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

Subsectio Erythrosperma (Dahlst.) Schischk.

81. *T. tauricum* Kotov spec. nova.

Radix collo residuis fusciscentibus foliorum emortuorum vestito, subglabro; folia breviter petiolata, ad 8 cm longa, ad 2.5 cm lata, runcinatim pinnatisecta, laciniis lateralibus late triangularibus horizontaliter patentibus vel vix. retrorsis terminali sat parva, in parte media latissima; scapi ad 20 cm alti, calathidiis sat magnis ca 15 mm longis, 25 mm latis; involucri phylla exteriora lanceolato-ovatis ad late lanceolata plus minusve squarrosa, interioribus subaequilata, griseoloviridia, ecorniculata, vel breviter corniculata, interiora oblongo-linearia, exterioribus longissimis 2–2.5-plo longiora, sub apice manifeste corniculata. Flores flavi; achenia rubro-fusca, parte dilatata 3–4 mm longa, dimidio superiore muriculata; pyramis ca 0.75 mm longa; rostrum 9–10.5 mm longum; pappus 7.5–8 mm longus, albus. Fl. April-Majo.

Habitat in declivibus lapidosis.

Species Tauriae (Karadag) endemica.

Typus: Tauria, distr. Sudak, karadag, Mons Sanctus << Svjataja >> dictus 24 V 1941, M. Kotov; in Herb. Inst. Bot. Ac. Sc. Ucrainiae Kioviae conservatur.

Adnot. Descriptionem huius speciei a M. Kotov ad edendum benevole missam recepimus; fide auctoris species haec a *T. erythrospermo* Andr. calathidiis majoribus, pappo longiore necnon habitatione in declivibus lapidosis siccis (non in locis humidis, steppis et pratis subsalsuginosis) differt.

Subsectio mongolicae (Dahlst.) Kitam.

82. *T. Ikonnikovii* Schischk. spec. nova.

Planta 8–25 cm alta; radix crassa, plerumque pluriceps, collo residuis atro-fuscis numerosis foliorum emortuorum vestito, in axillis tomentulo fusciscenti e pilis flexuosis longis constituto praedito; folia 8–15 cm longa, 737 8–25 mm lata. plus minusve sparse pilosa ad glaberrima, pinnatipartita,

laciniis sat remotis plerumque integerrimis ad integra margine plus minusve dentata vel etiam integerrima, petiolata, petiolis sat longis, anguste alatis; scapi plerumque araneosi, tempore florendi et postea sub calathidiis laxissime araneoso-tomentelli; involucri 10–14 mm longi, pallide viridis phylla exteriora a late ovatis ad lanceolato-ovata, appressa, interioribus multo latiora, herbaceo-membranacea, margine albida et plus minusve dentata, sub apice breviter sed non semper distincte corniculata, interiora oblongo-lineararia exterioribus longissimis pro more duplo longiora, herbacea, superne plus minusve rubescentia, inconspicue breviter corniculata vel ecorniculata. Flores pallide flavi, marginales ligulis subtus stria lata obscura notatis, corollis in parte media breviter pilosis; achenia pallide fusca parte dilatata 3–3.5 mm longa, costulis sat numerosis angustis praedita, a basi fere dense muriculata; pyramis 0.7–1 mm longa, a rostro bene limitata; rostrum 6–8 mm longum; pappus ca 6 mm longus, albidus. Fl. Junio-Julio.

Habitat in pratis, declivibus lapidosis et glareosis regionis montanae superioris, Species Asiae Mediae endemica.

Typus: Regio autonoma Badachschania Montana, vallis fl. Pschart occidentalis infra ostium fl. Dzhankandy 5 VII 1958, n° 440, N. Tzvelev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

83. *T. badachschanicum* Schischk. spec. nova.

Radix sat crassa, collo residuis fusciscentibus foliorum emortuorum vestito; folia 4–12 cm longa, 1–3 cm lata runcinatim pinnatipartita vel pinnatilobata, dentibus vel lobis intermediis praedita, apice acuta vel acutiuscula, glabra, laciniis vel lobis lateralibus plerumque vix retrorsis, margine saepe dentibus solitariis praeditis; scapi plerumque foliis subaequilongi, superne tantum sub calathidiis laxe araneoso-tomentosi, interdum subglabri; involucri 12–15 mm longi, pallide viridis phylla exteriora a late ovatis ad lanceolato-ovata, appressa, interioribus multo latiora, herbaceo-membranacea, sub apice (non semper) distincte sed breviter corniculata, interiora exterioribus longissimis 2–2.5-plo longiora, oblongo-lineararia, herbacea, sub apice distincte corniculata. Flores pallide flavi, marginales ligulis subtus stria lata obscura notatis, corollis in parte media sat dense sed breviter pilosis; achenia pallide fusca, parte dilatata 3.5–4 mm longa, triente superiore sat breviter muriculata, infra secus costulas brevissime aculeolata; pyramis 0.6–0.8 mm longa; rostrum 6–7 mm longum; pappus 7–8 mm longus; albus. Fl. Junio-Julio.

Habitat in declivibus lapidosis, glareosis siccis supra 3000 m s m Species Asiae Mediae (Pamir) endemica.

Typus: Regio autonoma Badachschania Montana; systema fl. Pschari occidentalis, vallis fl. Pschart in fluxu inferiore 14 VI 1958, n° 114, N. Tzvelev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

84. **T. Stanjukoviczii Schischk.** spec. nova.

738 Planta 6–25 cm alta; radix sat crassa, haud raro pluriceps, collo glabor; folia 7–15 cm longa, 2–3.5 cm lata, glabra, viridia, integra, margine grosse dentata ad haud profunde pinnatipartita, laciniis lateralibus sat latis integerrimis, terminali plerumque majore; scapi sub calathidiis vix araneosi, saepe subglabri: involucri 12–18 mm longi phylla exteriora a lanceolato-ovatis ad late lanceolata, plus minusve appressa, interioribus vix latiora, atro-viridia, angustissime membranaceo-marginata, sub apice corniculis parvis obtusis vel obtusiusculis plerumque obscuris praedita, interiora oblongo-lineararia, exterioribus longissimis 1.5–2-plo longiora, sub apice corniculis parvis obscuris praedita vel ecorniculata. Flores flavi, corollis subglabris, marginales ligulis subtus stria lata obscura notatis; achenia pallide flavido-fusca, parte dilatata 3.5–4 mm longa, sulcis longitudinalibus sat numerosis exarata, dimidio superiore plus minusve muriculata, infra breviter obtuse tuberculata; pyramis 0.8–1.2 mm longa; rostrum 7–10 mm longum; pappus 7–8 mm longus, albus, Fl. Julio-Augusto.

Habitat in pratulis et glareosis regionis montanae superioris.

Species Asiae Mediae (Pamir) endemica.

Typus: Regio autonoma Badachschania Montana; Pamir boreali-occidentalis, ripa sinistra fl. Tachta-Korum 2 km supra ostium 29 VII 1958, n° 919 N. Tzvelev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

85. **T. modestum** Schischk. spec. nova; Kovalevskaya in Fl. Uzbek. VI (1962) 461, descr. ross.-*T. alpinum* auct. non. Hegetschw. et Heer: Hand. Mazz. Monogr. Tarax. (1907) 94 p. p.

Planta 4–12 cm alta; radix sat crassa, haud raro pluriceps, collo glabro vel vix piloso; folia 4–12 cm longa, 5–20 mm lata plus minusve sparse pilosa, plerumque subglabra, runcinatim pinnatipartita, laciniis lateralibus horizontaliter patentibus vel retrorsis, vulgo integerrimis, terminali parva, saepe lacinulis intermediis praedita; scapi sub calathidiis plus minusve laxe araneoso-tomentelli; involucri 8–13 mm longi viridis phylla exteriora a late lanceolatis ad lanceolata, plus minusve appressa, interioribus subaequilata (sed interdum angustiora), angustissime membranaceo-marginata, pilis flexuosis paucis praedita, ecorniculata vel corniculis obscuris subinconspicuis praedita, interiora oblongo-lineararia, exterioribus longissimis vulgo duplo longiora, in parte superiore obscura ecorniculata vel corniculis parvis subinconspicuis praedita, Flores flavi vel pallide flavi, corollis in parte media parce pilosis, marginales ligulis subtus stria lata obscura praeditis; achenia pallide fusca, parte dilatata ca 3.5 mm longa, sulcis longitudinalibus paucis exarata, triente superiore plus minusve breviter muriculata, partim squamoso-tuberculata; pyramis 0.7–1 mm

longa, in rostrum sensim abiens; rostrum 5–6 mm longum; pappus 4–5 mm longus, albus. Fl. Julio.

Habitat in declivibus pratensi-stepposis regionis montanae mediae et superioris.

Species Asiae Mediae (Tjan-Schan occidentalis) endemica.

Typus: Mons Czimgan, 1904, collector ignotus: in Herb. Inst. Bot.

Ac. Sc. URSS in Leningrad conservatur: isotypus ibidem.

739 86. **T. Saposhnikovii** Schischk. spec. nova.

Planta 3–8 cm alta; radix sat crassa, haud raro pluriceps, collo residuis atro-fuscis foliorum emortuorum vestito, glabro; folia 4–8 cm longa, 8–17 mm lata, glabra, basi in petiolum brevem angustata, vix glaucescentia, runcinatum pinnatipartita, lanciniis lateralibus ab utroque latere 2–5 plus minusve retrorsis latis saepe apice obtusiusculis, terminali eis majore; scapi sub calathidiis laxe araneoso-tomentelli; involucri 9–14 mm longi phylla exteriora a late ovatis ad lanceolato-ovata, plus minusve appressa, interioribus sublatiora, herbaceo-membranacea, distincte reticulata, ecorniculata vel corniculis parvis obscuris praedita, interiora oblongo-lineararia, exterioribus longissimis 2–2.5-plo longiora, apice obscuriora, partim ecorniculata vel corniculis parvis praedita. Flores albidus vel pallide flavi (?), marginales ligulis subtus stria lata roseola in sicco roseo-violacea notatis, corollis subglabris; achenia pallide fusca, parte dilatata 3.5–4 mm longa, sulcis longitudinalibus sat paucis exarata, dimidio superiore muriculata, infra breviter ac obtuse tuberculata; pyramis ca 0.6 mm longa; rostrum in acheniis non sat maturis 4–5 mm longum; pappus ca 5 mm longus, albus, Fl. Junio-Julio.

Habitat in declivibus lapidosis ac schistosis, in glareosis regionis montanae superioris.

Typus: Jugum Saur, Sary-Czoku, dorsum jugi ad ripam sinistram fl. Terekta 2 VI 1914, B. Schischkin; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

87. **T. atrans** Schischk. spec. nova.

Radix sat tenuis, verticalis vel ascendens, collo residuis fuscescentibus foliorum emortuorum vestito; folia 2–8 cm longa, 3–12 mm lata, integra ad basin sensim angustata, apice obtusa vel acutiuscula, margine sinuato-dentata, rarius inegerima vel haud profunde lobata; scapi solitarii vel pauci, foliis subaequilongi, sub calathidiis copiose araneoso-tomentelli; involucri 8–10 longi phylla herbacea, viridia, anguste membranaceo-marginata, apice plerumque (i.e. in phyllis calathidii nonnullis) breviter obtuse corniculata, exteriora a late ovatis ad lanceolato-ovata, appressa, eis distincte latiora, interiora exterioribus longissimis plerumque duplo longiora, oblongo-lineararia, Flores pallide flavi, marginales ligulis subtus stria lata obscura notatis, tubulo glabro; achenia pallide flavido-fusca, parte dilatata 2.5–3

mm longa, dimidio superiore sat dense muriculata; pyramis ca 0.5–0.8 mm longa, in rostrum sensim abiens; rostrum 5.5–6.5 mm longum; pappus ca 6 mm longus, albus, Fl. Junio-Julio.

Habitat in declivibus lapidosis et schistosis, in glareosis regionis alpinae.

Species. Asiae Mediae (Tjan-Schan orientalis) incola.

Typus: Tjan-Schan, brachia montium Dzhungoltau, declivitas schistosa sellae tractus Kara-Kol 2 VII 1916, n° 2075, M. Sovetkina et S. Czaussova; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

88. **T. vassilczenkoi** Schischk. spec. nova.

740 Planta 2.5–8 cm alta; radix sat crassa, saepe pluriceps, collo residuis fusciscentibus foliorum emortuorum vestito, glabro vel subglabro; folia 3–10 cm longa, 4–14 mm lata, glabra vel subglabra, viridia, ad basin in petiolum sat longum anguste alatum sensim attenuata, integra, sinuato-dentata ad pinnatipartita, laciniis lateralibus paucis integerrimis vel subintegerrimis, terminali eis majore; scapi sparse araneosi, sub calathidiis sat copiose araneoso-tementelli; involucri 9–13 mm longi viridis phylla superne plerumque plus minusve roseolo-violacea, ecorniculata vel partim indistincte corniculata, exteriora a late lanceolatis ad lanceolata, plus minusve appressa, interioribus subaequilata vel sublatiora, angustissime membranaceo-marginata, superne margine plus minusve pilosa, interiora oblongo-linearia, exterioribus longissimis 1.5–2-plo longiora. Flores flavi, corollis glabris vel subglabris, marginales ligulis subtus stria lata obscura notatis; achenia pallide fusca, parte dilatata 2.5–3 mm longa, sulcis longitudinalibus paucis exarata, triente superiore muriculata; pyramis 0.4–0.6 mm longa; rostrum 6–8 mm longum; pappus 5–6 mm longus, albus. Fl. Julio-Augusto.

Habitat in declivibus herbosis, pratulis regionis montanae mediae et superioris.

Species Asiae Mediae (partis occidentalis Pamiro-Alaj) endemica.

Typus: Jugum Hissaricum, systema fl. Tupalang, locus Bagoli-Schamol dictus prope montem Zardolju-Pass 1 VIII 1960, n° 71, I, Vassilczenko et L. Vassiljeva; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

89. **T. kirghizicum** Schischk. spec. nova.

Radix sat crassa, verticalis, collo residuis fusciscentibus foliorum emortuorum vestito, glabro; folia numerosa, 2–6 cm longa, 0.5–1 cm lata, integra, margine plus minusve sinuato-dentata; scapi sub calathidiis parce araneosi; involucri ca 10 mm longi phylla exteriora ab ovatis ad lanceolato-ovata, plus minusve appressa, fructificatione reflexa interioribus multo

latiora, herbaceo-membranacea, margin et in parte superiore plus minusve roseola, ecorniculata, interiora oblongo-lineararia, atro-viridia, sub apice indistincte corniculata vel ecorniculata. Flores pallide flavi(?), marginales ligulis subtus stria lata obscura notatis; achenia pallide flavido-fusca, parte dilatata ca 3 mm longa, parte superiore parce muriculata sensim in pyramidem brevem abeunte; rostrum 7–8 mm longum; pappus albus, ca 5 mm longus. Fl. Julio.

Habitat in declivibus lapidosis, in steppis montanis.

Species Asiæ Mediae (Jugi Alaici) endemica.

Typus: Jugum Alaicum, Sary-Tasch 22 VII 1930, n° 61, S. Juzepozuk; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

90. **T. songoricum** Schischk. spec. nova.

Radix sat crassa, verticalis, collo residuis atro-fuscis foliorum emortuorum vestito; folia sat numerosa 4–12 mm longa, glabra vel vix araneosa, plerumque pinnatilobata, lobis vix retrorsis acutis integerrimis, rarius integra et subintergerrima, lobo terminali multo majore; scapi foliis subaequilongi, solitarii vel pauci, sub calathidiis sat copiose araneosotementelli; involucri 12–17 mm longi phylla exteriora appressa, interioribus sublatoria. ab oblongo-ovatis ad oblongo-lanceolata, viridia, sed saepe vix roseola, ecorniculata, interiora exterioribus longissimis duplo longiora, 741 oblongo-lineararia, viridia, angustissime membranaceo-marginata, apice atro-viridia, ecorniculata. Flores pallide flavi, marginales ligulis subtus stria lata obscura (violacea) notatis; achenia pallide flavido-fusca, costata, parte dilatata 2.5–3 mm longa, triente superiore tantum sat parce muriculata; pyramis 0.4–0.5 mm longa; rostrum tenue, 4.5–6 mm longum; pappus ca 5 mm longus, albus Fl. Julio-Augusto.

Habitat in declivibus lapidosis et schistosis, glareosis regionis montanae superioris.

Species Asiae Mediae (Alatau Songoricus) incola.

Typus: Alatau Songoricus, systema fl. Koksü, fontes glaciales fl. Korzun 24 VIII 1948, V. Goloskokov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

91. **T. schugnanicum** Schischk. spec. nova.

Planta 6–20 cm alta; radix sat crassa, collo residuis nigro-fuscis foliorum emortuorum vestito, glabro; folia 3–10 cm longa, 5–12 mm lata, glabra, basi in petiolum brevem late alatum attenuata, integra, margine breviter sinuato-dentata; scapi sub calathidiis vix araneosi; involucri 8–10 mm longi phylla exteriora a late ovatis ad lanceolato-ovata plus minusve appressa, interioribus sublatoria, tota fere membranacea, viridiusculo-alba, distincte reticulata, sub apice corniculis sat magnis sed brevibus et obtusis praedita, interiora oblongo-lineararia, exterioribus longissimis plerumque

subduplo longiora, viridia, apice obscuriora, sub apice corniculis parvis praedita. Flores flavi, corollis in parte media breviter pilosis; achenia pallide fusca, parte dilatata ca 2.5 mm longa, sulcis longitudinalibus sat paucis exarata, dimidio superiore muriculata; pyramis ca 0.4 mm longa; rostrum 4.5–5.5 mm longum; pappus 5–6 mm longus. Fl. Julio-Augusto.

Habitat in pratulis, declivibus lapidosis, in glareosis regionis montanae superioris.

Species Asiae Mediae (Pamir occidentalis) endemica.

Typus: Schugnan, locus Dzhauean-Kuss dictus, vallis fl. Schachdara 24 VII 1897, n° 1684, S. Korshinsky; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

92. **T. Rubtzovii** Schischk. spec. nova.

Planta 3–12 cm alta; radix sat crassa, haud raro pluriceps, collo glabro; folia 4–10 cm longa, 8–15 mm lata, glabra, integra, margine breviter et remote dentata ad subintegerrima; scapi glaberrimi, rarius pilis felxuosis solitariis praediti; involucris sub anthesi 11–13 mm longi phylla exteriora a late lanceolatis ad lanceolata, appressa vel in parte superiore plus minusve squarrosa, interioribus subaequilata, pro more pallide viridia plus minusve roseola, distincte reticulata, ecorniculata, interiora oblongo-lineararia, exterioribus longissimis plerumque 1.5-plo longiora, viridia, superne obscuriora, ecorniculata vel indistincte corniculata, Flores pallide flavi, marginales ligulis subtus stria lata obscura (sordide violacea) notatis, corollis in parte media breviter appresse pilosis; achenia immatura ignota, parte dilatata ut videtur sulcis longitudinalibus numerosis exarata, a basi fere muriculata; pappus ca 5 mm longus, albus. Fl. Julio-Augusto.

742 Habitat in declivibus schistosis et lapidosis, in glareosis regionis montanae superioris.

Species Asiae Mediae endemica.

Typus: Tjan-Schan, jugum Ketmenj-Tau, locus Komirczi dictus ca 3200 m.s.m. 10 VIII 1946, N. Rubtzov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

93. **T. perpusillum** Schischk. spec. nova.

Planta 1.5–5 cm alta; radix sat crassa, saepe pluriceps, collo glabro vel subglabro; folia 2–6 cm longa, 4–7 mm lata, glabra, vix glaucescenti-viridia, pinnatipartita, laciniis lateralibus ab utroque latere 4–7 sat latis saepe retrorsis, integerrimis vel subintegerrimis, terminali majore; scapi in parte superiore vix araneosi, saepe subglabri; involucris 7–10 mm longi phylla exteriora pauca, a late lanceolatis ad lanceolata, plus minusve appressa et interioribus subaequilata, herbaceo-membranacea, margine lato albido membranaceo cincta, pilis flexuosis sparsis praedita, sub apice subinconspectue corniculata vel ecorniculata, interiora oblongo-lineararia,

exterioribus longissimis 1.5–2-plo longiora, superne obscuriora, subinconspicue corniculata vel eorniculata. Flores pallide flavi vel albidii (?), corollis glabris, marginales ligulis subtus stria lata obscura notatis; achenia pallide flavido-fusca, parte dilatata 2.5–3 mm longa, costis longitudinalibus sat paucis praedita, dimidio superiore muriculata, infra parce breviter ac obtuse tuberculata; pyramis 0.2–0.4 mm longa; rostrum 6–7 mm longum; pappus ca 5 mm longus, albidus. Fl. Augusto.

Habitat in declivibus schistosis, glareosis regionis montanae superioris.

Species Alatau Songorici incola.

Typus: Alatau Songoricus, declivitas faucium Sajtepteka 23 VIII 1930, n° 595, L. Rodin; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur: isotypus ibidem.

Sectio 4. *Laevia* (Hand.-Mazz.) Schischk.

94. **T. turiense** Orlova spec. nova. -*T. leucanthum* auct. non Ldb.: Hulten, Atlas, Växt. Nord. (1950) 460 n° 1793.

Radix sat tenuis, saepe pluriceps, collo grabro; folia 3–18 cm longa, 2–8 mm lata, glabra, apice acutiuscula, integra, integerrima vel margine breviter et remote dentata, ad basin in petiolum plus minusve violaceum anguste alatum sensim attenuata, sat carnosa; scapi 1–7 glaberrimi, fructificatione valde elongati et vulgo nutantes; involucri 10–13 mm longi glabri phylla exteriora a late lanceolatis ad anguste lanceolata, viridia, interdum anguste membranaceo-marginata, plus minusve squarrosa, fructificatione ad reflexa, sub calathidiis omnia vel nonnulla corniculis parvis praedita, interiora oblongo-linearia, exterioribus longissimis plerumque 2–5-plo longiora, eorniculata vel indistincte corniculata. Flores pallide flavi: achenia pallide fuscido-grisea, parte dilatata 3.5–4 mm longa, dimidio superiore sat dense muriculata, apice in pyramidem ca 1 mm longam sat sensim abeuntia; rostrum 4–5 mm longum; pappus 5–7 mm longus, saepe vix flavidus, Fl. Junio-Julio.

743 Habitat in declivibus lapidosis et saxis prope litus maritimum.

Species peninsulae Kolaënsis endemica.

Typus: Regio Murmanica, peninsula Turij, ad promontorium Turij 29 VII 1962, n° 64, N. Orlova; in Hort. Bot. Arcto-Alpino filiae Kolaënsis Ac. Sc. URSS in Kirovsk conservatur.

95. **T. atratum** Schischk. spec. nova.

Radix sat tenuis, verticalis vel ascendens, collo residuis fusciscentibus foliorum emortuorum vestito; folia 3–8 cm longa, 4–12 mm lata, basi in petiolum anguste alatum sensim attenuata, apice obtuse vel acutiuscula, vulgo integra margine sinuato-dentata, rarius integerrima vel haud profunde lobata; scapi solitarii vel pauci foliis subaequilongi, glaberrimi, post

anthesin pro more nutantes; involucri 10–14 mm longi phylla herbacea, plerumque atro-viridia, angustissime membranaceo-marginata, sub apice ecorniculata vel indistincte brevissime corniculata, exteriora ab ovatis ad ovato-lanceolata, appressa, interioribus paulo latiora, interiora exterioribus longissimis vulgo duplo longiora, oblongo-linearia. Flores pallide flavi, marginales ligulis subtus stria lata obscura (pro more violascete) notatis, corollis subglabris, in parte tubulorum superiore et in parte ligulae inferiore parce breviter pilosis; achenia pallide fusca, parte dilatata 3.5–4 mm longa, quadrante superiore tantum sat parce et breviter muriculata; pyramis 0.4–0.5 mm longa; rostrum 4–6 mm longum; pappus 5–6 mm longus, albus. Fl. Julio-Augusto.

Habitat in declivibus schistosis et. argillosis, in glareosis regionis alpinae.

Species Alatau songorici incola.

Typus: Alatau Songoricus, systema fl. Koku, loca ripae sinistrae fl. Kasan in fluxu medio adjacentia 30 VIII 1948, V. Goloskokov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur. Isotypi ibidem.

96. **T. subglaciale** Schischk. spec. nova.

Planta 3–8 cm alta; radix sat crassa saepe pluriceps, collo residuis atrofusis foliorum emortuorum vestito, glabro; folia 3–8 cm longa, 3–8 mm lata, glabra, viridia, petiolata, petiolis longis anguste alatis, remote pinnatilobata, lobis lateralibus ab utroque latere 2–4 apice plus minusve acutiusculis integerrimis; scapi glaberrimi, post anthesin recurvi; involucri 10–14 mm longi sat angusti phylla exteriora a late lanceolatis ad lanceolata, appressa interioribus subaequilata vel vix angustiora, margine lato membranaceo albido cincta, ecorniculata, rarius partim indistincte corniculata, interiora oblongo-linearia, exterioribus longissimis 2–2.5-plo longiora, apice obscuriora, ecorniculata vel indistincte corniculata, Flores flavi vel pallide flavi, marginales ligulis subtus stria lata obscura notatis; achenia pallide fuscidulo-viridia, parte dilatata 3.5–4.5 mm longa, sulcis longitudinalibus paucis exarata, superne parce subinconspicue tuberculata, sublevia, apice in pyramidem ca 0.5 mm longam a rostro bene limitatam sensim abeuntia; rostrum 3.5–5 mm longum; pappus ca 5 mm longus. albus, Fl. Julio-Augusto,

Habitat in declivibus argillosis et lapidosis regionis montanae superioris.

Species Alatau Songorici incola.

744 *Typus:* Alatau Songoricus, systema fl. Koku, inter fl. Arassan et Tentekaja. 14 VIII 1948, V. Goloskokov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

97. Sectio 5. **Porphyrantha** Schischk. sect. nova.-Sect. orientalia Hand-Mazz. in Osterr. Bot. Zeitschr. 6–8 (1925) 274 p. p.

Plantae humiles vel mediocres, altimontanae, Junio-Augusto. florentes. Radix plus minusve crassa, collo glabro; folia herbacea; scapi pro more glaberrimi; involucri phylla ecorniculata vel corniculis parvis praedita, exteriora sat pauca, appressa vel plus minusve squarrosa, interiora exterioribus longissimis 1.5–2-plo longiora. Flores rosei vel purpurei; achenia pallide fusca, parte dilatata 3–4 mm longa, parte superiore plus minusve dense muriculata, in pyramidem 0.4–0.8 mm longam sat abrupte abeuntia; rostrum 3–8 mm longum parte dilatata plerumque 1.5–plo et plus longius, rarius in acheniis ut videtur non sat maturis vix longius.

Sectionist typus: *T. prophyranthum* Boiss.

98. ***T. pseudoroseum*** Schischk. spec. nova.

Planta 6–25 cm alta; radix sat tenuis, collo glabro; folia 4–15 cm longa, 8–25 mm lata, glabra viridia, basi in petiolum anguste alatum sensim attenuata, integra, margine remote sinuato-dentata (interdum pro parte integerrima) ad pinnatilobata, lobis lateralibus 2–5 ab utroque latere latis integerrimis vel subintegerimis, terminali multo majore; scapi 2–5 glabri, raro subglabri; involucri 14–20 mm longi viridis phylla exteriora a lanceolato-ovatis ad lanceolata, plus minusve squarrosa, interdum reflexa, interioribus subaequilata, viridia, angustissime membranaceo-marginata, ecorniculata, interiora oblongo-linearia, exterioribus longissimis vulgo duplo longiora, atro-viridia, ecorniculata. Flores rosei vel pallide lilacini(?), marginales ligulis subtus stria lata obscura notatis; achenia pallidie fusca, parte dilatata ca 3 mm longa, dimidio superiore plus minusve muriculata, infra parce tantum brevissime obtuse tuberculata; pyramis ca 0.5 mm longa; rostrum 6–8 mm longum; pappus 6–7 mm longus, albidus, saepe vix fuscidulus. Fl. Junio-Julio.

Habitat in declivibus lapidosis, in pratulis, in glareosis regionis montanae superioris.

Species Asiae Mediae (partis orientalis Tjan-Schan) endemica.

Typus: Tjan-Schan, brachia borealia Kungej-Alatau, in angustiiis Czetj-Nerke, 1 VII 1937, V. Goloskokov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

Sectio VI. **Scariosa** Hand.-Mazz.

99. ***T. Pobedimoviae*** Schischk. spec. nova.

Planta 6–20 cm alta; radix crassissima, plerumque multiceps, collo residuis atro-fuscis foliorum emortuorum vestito, in axillis sat copiose fuscidulo-tomentello: folia 2–8 cm longa, 4–8 mm lata, sparse pilosa ad subglabra. integra plus minusve dentata ad pinnatipartita, laciniis lateralibus

- 745 paucis plus minusve retrorsis terminali multo majore, sub anthesi saepe vix evoluta; scapi plerumque pauci, sat tenues, sub calathidiis tantum laxe araneoso-tomentosi; involucris 8–15 mm longi glaucescenti-viridis phylla exteriora a lanceolato-ovatis ad lanceolata, plus minusve appressa, interioribus subaequilata, margine membranaceo sat lato albido, cincta, breviter ciliolata, sub apice brevissime obtuse atro-corniculata vel ecorniculata, interiora oblongo-linearia, exterioribus longissimis plerumque 2.5-plo longiora, sub apice indistincte atro—corniculata vel ecorniculata. Flores aurantiaci, corollis subglabris, marginales ligulis subtus stria lata roseola notatis; achenia fuscicula, parte dilatata ca 4 mm longa, sulcis sat paucis exarata, triente superiore sat grosse muriculata, infra (fere ad basin) brevissime tantum obtuse tuberculata; pyramis 1–1.4 mm longa; rostrum 7–8 mm longum; pappus ca 5 mm longus, albidus, saepe vix fusciculus. Fl. Augusto-Septembri.

Habitat in declivibus argillosis et calcareis.

Species Taurica (vicinae opp. Sebastopolis) endemica.

Typus: vicinae opp. Sebastopolis, sinus Kamyschevaja, in abruptis argilloso-calcareis, apud mare 25 VIII 1962, n° 484, E. Pobedimova et V. Gladkova: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

100. **T. ciscaucasium** Schischk. spec. nova-*T. megalorrhizon* auct. non Hand.-Mazz.: Schischk. in Gross. Fl. Kavk. IV (1934) 249; Gross. Opređ. Rast. Kavk. (1949) 249.

Radix sat crassa, saepe pluriceps, collo inter bases petiolorum foliorum vegetorum ac emortuorum copiose laxe tomentello; folia sat crassiuscula, glabra vel vix pilosa, viridia, 2–6 cm longa, 1–1.5 cm lata, pinnatipartita, laciniis lateralibus sat paucis late triangularibus, haud raro lacinulis intermediis minoribus, interdum pro parte integra, margine sinuato-dentata; scapi 4–10 cm longi, initio per totam fere longitudinem, dein superne tantum laxiuscule araneoso-tomentelli: involucris ca 10 mm longi phylla exteriora ab ovatis ad ovato-lanceolata, plus minusve appressa, interioribus sublata, margine albo-membranacea, olivaceo-viridia, superne interdum rubescentia, sub apice breviter, non semper manifeste corniculata, interiora oblongo-linearia, exterioribus longissimis 2–2.5-plo longiora, sub apice vulgo breviter corniculata. Flores citrini, ligulis subtus striis rubescentibus vel lilacinis notatis; achenia pallide fusca, parte dilatata ca 4 mm longa, dimidio superiore sat dense muriculata; pyramis 1–1.5 mm longa; rostrum 4–7 mm longum; pappus ca 6 mm longus, albidus vel vix fusciculus. Fl. Julio-Septembri.

Habitat in pratis subsalsuginosis.

Species Ciscaucasiae endemica.

Typus: Regio Stauropoliensis, in viciniis pagi Blagodatnoje, collector ignotus; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Sectio VII. **Rhodotricha** Hand.-Mazz.101. **T. daralagesicum** Schischk. spec. nova.

Radix sat crassa multiceps, collo residuis numerosis atro-fuscis foliorum emortuorum vestito, inter bases petiolorum plus minusve copiose fuscidulo-tomentello; folia viridia, plus minusve sparse crispulo-pilosa ad glaberrima, 5–12 cm longa, 0.5–3 cm lata, ab integris, margine plus minusve sinuato-dentatis ad pinnatilobata vel pinnatipartita, laciniis lateralibus paucis pro more integerrimis apice longe acuminatis, terminali multo majore ac latiore; scapi numerosi, foliis aequilongi vel sublongiores, plus minusve araneoso-tomentosi, sub calathidiis copiosius araneoso-tomentelli; involucri 10–13 mm longi phylla exteriora a late lanceolatis ad lanceolata, plus minusve squarrosa et interioribus subequilata, herbaceo-membranacea, pallide viridia, margine membranaceo lato albido cincta, apice plus minusve purpurea, sparse pilosa, ecorniculata, interiora oblongo-lineararia, exterioribus longissimis 2.5–3 plo longiora, viridia, herbacea, margine membranaceo albido cincta, apice, obscuriora, ecorniculata, Flores flavi, mirginales, ligulis subtus stria lata obscura notatis, corollis in parte media sat copiose pilosis; achenia pallide flavido-fusca, partite dilatata 4–5 mm longa, costulis subincospicuis, levia vel sublevia (parte superiore parce brevissime muriculata), in pyramidem sensim abeuntia; pyramis in rostrum crassiusculum 2.5–4 mm longum sensim desinens; pappus 5–6 mm longus, albidus, plerumque vix fuscidulus Fl. Augusto-Septembri.

Habitat in declivibus siccis glareosis.

Species Transcaasiae (Jugum Daralagez) endemica.

Typus: Armenia, Daralagez pagus, Okbadyr-Alagez 8 IX 1931, 1. Karjagin et B. Sophijev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypi ibidem et Herb. Inst. Bot. Ac. Sc. Azerbajdzhaniae in Baku.

102. **T. Voronovii** Schischk. spec. nova.

Planta 2–12 cm alta; radix crassa pro more multiceps, collo residuis numerosis atro-fuscis foliorum emortuorum vestito, in axillis copiose fuscidulo-tomentello; folia 3–10 cm longa, griseolo-viridia, utrinque sparse crispulo-pilosa, a pinnatilobatis ad pinnatipartita, lobis vel laciniis lateralibus angustis vel sat latis saepe margine dentatis; scapi 1–5, sat tenues ante anthesin aranecso-tomentelli dein plus minusve glabrescentes, sed sub calathidiis semper plus minusve tomentosi; involucri 8–14 mm longi vix glaucescentis phylla in parte superiore vix pilosa vel glabra, ecorniculata, exteriora a lanceolatis ad lanceolato-linear laxe appressa, interioribus subaequilata vel subangustiora, anguste membranaceo-marginata, apice saepe longe acuminata, interiora oblongo-lineararia, exterioribus longissimis sesqui-duplo longiora. Flores pallide flavi vel flavi

(?) corollis in parte media breviter pilosis, marginales ligulis subtus striis obscuris non sat manifestis notatis: achenia pallide fusca, parte dilatata ca 4 mm longa, sulcis longitudinalibus paucis exarata, triente superiore brevissime muriculata, quasi transverse plicata infra plus minusve conspicue obtuse tuberculata, apice in pyramidem 0.6–0.8 mm longam sensissime abeuntia; pyramis a rostro 4.5–7 mm longo bene limitata: pappus ca 6 mm longus, albus. Fl. Augusto-Septembri.

Habitat in declivibus herbaceis siccis, in pascuis ad vias.

Species Transcaucasiae endemica.

Typus: Ossetia australis prope pagum Czreba 1. IX 1923. n° 870. S

Juzepczuk: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

747 Species valde propria eis sectionis Scariosa et Spuria valde appropinquat.

103. *T. varsobicum* Schischk. spec. nova.

Planta 4–10 cm alta: radix sat crassa, saepe multiceps, collo residuis fuscidulis foliorum emortuorum vestito, in axillis parce fuscidulo-tomentello; folia 3–10 cm longa, 7–20 mm lata, sparse pilosa vel subglabra, viridia, runcinatim pinnatipartita, laciniis lateralibus ab utroque latere 4–8, plus minusve retrorsis integerrimis vel subintegerrimis breviter acuminatis, terminali majore, lacinulis intermediis minoribus; scapi plerumque pauci sub calathidiis laxae araneoso-tomentelli, involucri 10–15 mm longi viridis phylla exteriora lanceolata-ovatis ad late lanceolata, plus minusve appressa, interioribus pro more sublatis, margine membranaceo angusto albido cincta, sub apice obscuriore corniculis parvis praedita vel eorniculata, interiora oblongo-linearia, exterioribus longissimis duplo longiora, sub apice corniculis sat magnis vel parvis praedita, rarius pro parte eorniculata. Flores flavi vel pallide flavi (?), corollis in parte media sparse breviter pilosis, marginales ligulis subtus stria obscura lata notatis; achenia pallide fusca, parte dilatata ca 4 mm longa, sulcis longitudinalibus paucis exarata, quadrante vel triente superiore sat parce muriculata; pyramis 0.6–0.8 mm longa, a rostro 4–5 mm longo bene limitata; pappus ca 6 mm longus, albus. Fl. Junio-Augusto.

Habitat in declivibus collium argillosis et schistosis, in glareosis regionis montanae mediae.

Species Asiae Mediae (partis occidentalis Pamiro-Alaj) endemica.

Typus: Declivitas australis jugi Hissarici, systema fl. Varsob, planities elata Rundascht, 2600 m. s. m. 28 V, 1946, n° 256, V. Pissjaukova: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Sectio 8. *Parvula* Hand.-Mazz.

104. *T. baicalense* Schischk. spec. nova.

Planta 2–5 cm alta; radix sat crassa, verticalis, saepe pluriceps, collo residuis atro-fuscis foliorum emortuorum numerosis tecto, inter petiolos

sat copiose fuscidulo-tomentello; folia 2–3 cm longa, 3–5 mm lata, fere ad nervum medium pinnatipartita laciniis lateralibus numerosis plerumque integerrimis acutis vel obtusiusculis, utrinque (ad nervum medium et in petiolis praecipue) laxiuscule araneoso-tomentella; scapi soitarii vel pauci, foliis plerumque sesqui longiores, per totam fere longitudinem, sub calathidiis praesertim laxiuscule tomentelli; involucri 7–10 mm longi phylla exteriora ca 8, ab ovatis ad lanceolato-ovata, appressa, interioribus sublitoria, margine albido-membranacea, pilis longis flexuosis tecta, sub apice ecorniculata, interiora oblongo-linearia, exterioribus longissimis plerumque 2.5–plo longiora, atro-viridia, anguste membranaceo-marginata, sub apice corniculata vel subinconspicue corniculata. Flores pallide flavi marginales ligulis subtus stria obscura fere destitutis, corollis in parte media breviter pilosis: achenia matura ignota: pappus ca. 5 mm longus, albus. Fl. Junio-Julio.

Habitat in pratis siccis.

Species Sibiriae orientalis endemica.

- 748 Typus: Ripa occidentalis lacus Baical, pagus Tagota 21 VI, 1928. n° 318, V. Sukaczhev, K. Rassadina et W. Bryszhev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

Sectio 9. **Orientalia** Hand.-Mazz.

105. **T. heptapotamicum** Schischk. sp nova.

Planta 2–8 cm alta; radix crassa, pro more multiceps, collo residuis atrofusis foliorum emortuorum tecto, glabro vel subglabro: folia glabra. glaucescenti-viridia, sat crassiuscula, 3–8 cm longa, 5–15 mm lata, integra. margine plus minusve dentata ad integerrima; scapi 1–4, foliis subaequilongis, sub calathidiis sat copiose laxe tomentelli; involucri 10–12 mm longi phylla atro-viridia. herbacea, dorso pro more sparse pilosa, sub apice brevissime atro-corniculata vel ecorniculata, exteriora ovata ad lanceolato-ovata, appresse interioribus subaequilata vel sublitoria, margine membranaceo lato albido cincta, interiora oblongo-linearia exterioribus longissimis sesqui-duplo longiora. Flores albi vel pallide flavi, in sicco vix roseoli, corollis in parte media parce breviter pilosis: achenia fuscidula, parte dilatata ca 4.5 mm longa, sublevi, parte superiore subinconspicue tuberculata, apice in pyramidem ca 0.8–1 mm longam sensim abeunte: pyramis in rostrum crassiusculum 3–4 mm longum sat sensim desinens: pappus ca 5 mm longus, albidus. Fl. Junio-Julio.

Habitat in declivibus argillosis, in pratulis subsalsuginosis glareosis regionis montanae superioris.

Species Asiae Mediae (partis orientalis Tjan-Schan) endemica.

Typus: Tjan-Schan, jugum Terskej-Alatau, prope observatorium 3 VII 1941, V. Goloskokov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

106. **T. Goloskokovii** Schischk. spec. nova.

Planta 5–10 cm alta; radix adscendens vel verticalis, saepe piuriceps collo residuis fuscidulis foliorum emortuorum vestito, glabro; folia glabra, sat longe petiolata, petiolis inclusis 3–7 cm longa, 2–8 mm lata, integra et integerrima ad pinnatipartita, laciniis lateralibus plerumque inaequimagnis retrorsis: scapi glaberrimi: involucris 8–12 mm longi vix glaucescenti-viridis phylla exteriora a lanceolato-ovatis ad lanceolata, appressa, interioribus subaequilata vel sublata margine albido-membranacea, sub apice ecorniculata vel corniculis parvis non semper bene conspicuis praedita, interiora oblongo-linearia, exterioribus longissimis duplo longiora, sub apice plerumque corniculis parvis obscurioribus praedita. Flores pallide flavi vel albidi, marginales ligulis subtus stria obscura lata notatis: achenia pallide fusca, parte dilatata 4–5 mm longa, levi vel in parte superiore vix tuberculata, apice sensim attenuata (pyramide subnulla), in rostrum breve crassiusculum 1–2 mm longum articulatione subinconspicua fragili abeunte: pappus ca 5 mm longus, albus, Fl. Julio-Augusto.

Habitat in declivibus argillosis et lapidosis regionis montanae superioris.

749 Species Asiae Mediae (Alatau Songorici) endemica.

Typus: Alatau Songoricus, systema fl. Koksu, fontes fl. Korzhu 24 VIII 1924. V. Goloskokov: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur: isotypus ibidem.

107. **T. Tzvelevii** Schischk. spec. nova.

Planta 1.5–6 cm alta; radix sat crassa, haud raro pluriceps, collo residuis numerosis nigro-fuscis foliorum emortuorum vestito, glabro vel subglabro; folia 2–5 cm longa, 3–9 mm lata, glabra, vix glaucescenti-viridia, integra et integerrima vel margine remote sinuato-dentata: scapi in parte superiore, sub calathidiis praecipue plus minusve araneoso-tomentosi; involucris 10–13 mm longi phylla exteriora a late ovatis ad lanceolato-ovata, plus minusve appressa, interioribus latiora, pallide viridia, margine membranaceo lato albido cincta, sub apice breviter atro-corniculata vel ecorniculata, interiora oblongo-linearia, exterioribus longissimis duplo longiora, sub apice breviter non semper distincte corniculata. Flores flavi, corollis glabris, marginales ligulis subtus stria obscura lata notatis; achenia pallide flavido-fusca, parte dilatata 3.5–4 mm longa, sulcis longitudinalibus sat numerosis exarata, triente superiore sat parce muriculata, apice in pyramidem ca 4 mm longam sensim abeunte: rostrum 2.5–3.5 mm longum; pappus ca 5 mm longus, saepe vix fuscidulus, Fl. Julio-Augusto.

Habitat in pratulis et glareosis regionis montanae superioris.

Species Asiae Mediae (Pamir) endemica.

Typus: Regio autonoma Badachschania Montana: systema fl. Biljand-

Kiik, ostium affluxionis sinistrae fl. Biljand-Kiik 6 km ad septentrionem a tractu Tachtakorum 1 VIII 1958, n° 1025, N. Tzvelev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

108. **T. Pojarkoviae** Schischk, spec. nova.

Planta 3–10 cm alta; radix crassa, pro more pluriceps collo glabro; folia 2–10 cm longa, 3–10 mm lata, numerosa, glabra, glaucescenti-viridia, integra margine plus minusve dentata (interdum pro parte integerrima) ad haud profunde pinnatipartita, laciniis lateralibus ab utroque latere 3–6, plus minusve retrorsis integerrimis, terminali plerumque majore; scapi vulgo adscendentes, sat numerosi, sub calathidiis laxae araneoso-tomentelli; involucri 10–13 mm longi phylla exteriora ab oblongo-ovatis ad oblongo-lanceolata plus minusve appressa, interioribus vix latiora, herbaceo-membranacea, pallide viridia, margine membranaceo lato albido cincta, saepe plus minusve dentata, eorniculata vel brevissime obtuse corniculata; interiora oblongo-linearia, exterioribus longissimis duplo longiora, atro-viridia, sub apice corniculis parvis obtusis praedita vel eorniculata, Flores pallide flavi, marginales ligulis subtus stria obscura lata notatis, corollis in parte media parce brevissime pilosis; achenia pallide fusca, parte dilatata 3.5–4 mm longa, sulcis longitudinalibus numerosis, sed subinconspicuis exarata, quadrante superiore, ad costas duas principales fere ad basin muriculata: pyramis 0.6–1 mm longa; rostrum crassiusculum 2–3.5 mm longum; pappus 6–7 mm longus, albus, interdum vix fuscidulus. Fl. Julio-Augusto (Tab. XXVI. fig. 2).

750 Habitat in salsuginosis, pratis salsuginosis, in glareosis regionis montanae superioris.

Species Asiae Mediae (partis orientalis Pamiro-Alaj) endemica.

Typus: Pamiro-Alaj, jugum Transalaicum, prope lacum Kara-Kul 23 VIII 1954, n° 605, P. Poljakov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur; isotypus ibidem.

109. **T. glabellum** Schischk. spec. nova.

Radix sat crassa, verticalis, saepe pluriceps, collo residuis numerosis nigro-fuscis foliorum emortuorum vestito, in axillis tomentulo non semper bene conspicuo laxo e pilis flexuosis longis efformato praedito; folia glabra, vix glaucescentia, 2–5 cm longa, 5–15 mm lata, integra margine plus minusve dentata ad pinnatipartita, laciniis lateralibus subretrorsis plus minusve dentatis; scapi 1–5 foliis subaequilongi, glabri vel vix araneosi; involucri 8–11 mm longi sat angusti phylla exteriora oblongo-ovata ad lanceolata, plus minusve squarrosa ad reflexa interioribus subaequilata, vulgo glaucescenti-viridia, sub apice subinconspicue breviter corniculata vel eorniculata; interiora oblongo-linearia, exterioribus longissimis plerumque 2–2.5-plo longiora, sub apice corniculis brevibus obscurioribus

praedita vel ecorniculata. Flores pallide flavi, marginales ligulis subtus stria lata obscura notatis, corollis in parte media breviter pilosis; achenia pallide fusca parte dilatata 3.5–4 mm longa, quadrante superiore parce sat breviter muriculata pyramis 0.7–0.8 mm longaa, in rostrum sensim abiens; rostrum 3–4 mm longum: pappus ca 3–5 mm longus, albus, Fl. Julio.

Habitat in declivibus lapidosis et argillosis regionis montanae superioris.

Species Asiae Mediae (Tjan-Schan, Karatau) endemica.

Typus L Tjan-Schan, jugum Karatau, mons, Myndzhilke 9 VII 1936 n° 196, G. Mikeschin; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

110. **T. rubidum** Schischk. spec. nova.

Planta 1.5–4 cm alta; radix sat crassa, saepe pluriceps, collo residuis fusciscentibus numerosis foliorum emortuorum vestito, glabro; folia 1.5–4 cm longa glabra, glaucescenti-viridia, petiolata, petiolis longis anguste alatis, plerumque lyratim pinnatipartita, laciniis lateralibus ab utroque latere 3–5 horizontaliter patentibus vel plus minusve retrorsis integerrimis, terminali multo majore integerrima; scapi sub calathidiis copiose laxe araneoso-tomentelli; involucri 8–10 mm longi glaucescenti-viridis phylla exteriora a lanceolato-ovatis ad late lanceolata appressa, interioribus subangustiora, margine membranaceo albido sat lato cincta ecorniculata, interiora oblongo-linearia, exterioribus longissimis 2–2.5 plo longiora, ecorniculata. Flores rosei vel rubescentes, marginales ligulis subtus stria obscura lata notatis; achenia pallide flavido-fusca, parte dilatata 4.5–5 mm longa, in parte superiore aculeolis sat brevibus paucis munita, apice in pyramidem 0.8–1 mm longam sensissime abeunte; rostrum in acheniis non sat maturis 0.6–1 mm longum. dein ut videtur longius (ad 2 mm longum): pappus ca 5 mm longus albus. Fl. Julio-Augusto (Tab. XXVII. fig. 3).

751 Habitat in glareosis, declivibus lapidosis ac schistosis regionis montanae superioris.

Species Asiae Mediae (partis orientalis Pamiro-Alaj) endemica.

Typus: Pars orientalis montium Pamiro-Alaj, regio autonoma Badachschania Montana, systema fl. Biljand-Kiik, 7 km ad septentrionem a tractu Tachtakorum 2 VIII 1958, n° 1067, N. Tzvelev; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Species incertae sedis

111. **T. alaicum** Schischk. spec. nova.

Radix sat crassa. verticalis vel oblique adscendens. collo residuis atrofusci foliorum emortuorum arcte vestito; folia numerosa 5–12 cm longa,

1.7–2 cm lata, glabra, profunde (sed non ad nervum medium) pinnatipartita, laciniis lateralibus sat remotis, lanceolatis, acutis, plerumque integerrimis, horizontaliter patentibus vel vix retrorsis, terminali majore, apice acuta; scapi plerumque 2–4, foliis subaequilongi, sub calathidiis plus minusve laxe araneoso-tomentosi; involucri 10–12 mm longi phylla exteriora appressa, interioribus latiora a late ovatis ad lanceolato-ovata, pallide virida, herbaceo-membranacea, ecorniculata, interiora exterioribus longissimis subduplo longiora, oblongo-linearia, sub apice subinconspectue corniculata. Flores albidii, marginales ligulis subtus stria lata violascente notatis; achenia pallide fuscidulo-flava, costata, parte dilatata 3.5–4.5 mm longa, triente superiore sat parce muriculata, infra aculeolis minutissimis tantum secus costas munita; pyramis 0.5–0.8 mm longa; rostrum sat tenue, 4–6 mm longum: pappus ca 5 mm longus, albus. Fl. Julio-Augusto.

Habitat in declivibus lapidosis, in glareosis regionis alpinae.

Species Asiae Mediae (Alaj) endemica.

Typus: Jugum Alaicum, Sary-Tasch, ripa affluentiae fl. Surkob 22 VII 1930, n° 807, S. Juzepczuk; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

112. **T. Linczevskii** Schischk. spec. nova.

Planta 5–15 cm alta; radix crassa, plerumque pluriceps, collo residuis nigro-fuscis foliorum emortuorum vestito, glabro; folia 5–12 cm longa, 8–16 mm lata, glabra vel subglabra, vulgo pinnatilobata lobis lateralibus plus minusve retrorsis, terminali sat parvo, rarius integra. margine sinuato-dentata vel non profunde pinnatipartita; scapi primo per totam longitudinem araneoso-pilosi, dein plus minusve glabrescentes, sed sub calathidiis semper copiose laxe araneoso-tomentelli; involucri sub anthesi 10–14 mm longi atro-viridis phylla exteriora breviter obtuse corniculata, vel (vulgo pro parte tantum) ecorniculata, exteriora a late lanceolatis ad lanceolata, sub anthesi plus minusve appressa, interioribus subaequilata, dein plus minusve squarrosa, margine membranaceo albido angusto cincta, interiora oblongo-linearia, exterioribus longissimis sesqui longiora. Flores flavi, corollis pilis longis et brevioribus plus minusve vestitis, marginales ligulis subtus stria obscura lata notatis: achenia (non sat matura) pallide flavido-fusca, parte

752 dilatata 2.5–3 mm longa, triente vel quadrante superiore sat parce breviter muriculata pyramis 0.5–0.7 mm longa: rostrum 3–4 mm longum: pappus ca 6 mm longusalbus. Fl. Junio-Julio.

Habitat in pratulis alpinis humidis regionis montanae superioris.

Species Asiae Mediae (partis occidentalis Tjan-Schan) endemica.

Typus: Tjan-Schan, Alatau Talassicus, montes Dzhebogly, tractus Uljkun-Kaindy 6 VII 1933, n° 313, I. Linczevski; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur: isotypi ibidem.

113. **T. Litwinowii** Schischk.; Gross. Fl. Kavk. IV (1934) 250 descr. ross.; t poccr , onpe pact KaBK (1949) 513; Kapeller in Fl. Gruzii VIII. 665.

Planta 5–15 cm alta; radix sat crassa, collo residuis atro-fuscis foliorum emortuorum vestito, glabro; folia 3–9 cm longa, 7–14 mm lata, glabra, sat crassiuscula, integra, margine denticulata ad integerrima: scapi glabri; involucri 10–14 mm longi phylla ecorniculata vel subinconspicue corniculata. exteriora ab ovato-lanceolatis adlanceolata, plus minusve appressa, interioribus pro more sublatis, heribaceo-membranacea, pallide viridia, saepe late albido-marginata; interiora oblongo-linearia, exterioribus longissimis vulgo 1.5–2 plo longiora, viridia vel atro-viridia, herbacea, Flores pallide flavi, marginales ligulis subtus stria obscura lata notatis; achenia pallide fusca, parte dilata 4–4.5 mm longa, sulcis longitudinalibus sat paucis exarata, triente superiore muriculata, apice in pyramidem conicam 0.4–0.6 mm longam a rostro vix tantum limitatam sat sensin abeunte; rostrum 6–8 mm longum; pappus 4–5 mm longus, albus, Fl. Julio.

Habitat in declivibus lapidosis et argillosis regionis montanae superioris.

Species Transcaasias incola.

Lectotypus: Turcia, prov. Kars. mons Surb-Chact 14 VII 1914. D. Litwinow; in Herb. inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

114. **T. oschense** Schischk. spec. nova.

Radix sat crassa, haud raro pluriceps, collo residuis atro-fuscis foliorum emortuorum vestito, in axillis plus minusve copiose laxo tomentello; folia 2.5–6 cm longa, 2–8 mm lata, vix glaucescenti-viridia, glabra, apice acutiuscula, exteriora rosulae plerumque integra, integerrima vel vix dentata. interiora a plus minusve dentatis ad haud profunde pinnatilobata, lobis lateralibus paucis (ab utroque latere 2–3), plus minusve retrorsis integerrima: scapi sub calathidiis laxo araneoso-tomentelli infra sparse araneosi ad subglabros: involucri 7–12 mm longi phylla exteriora a lanceolato-ovatis ad late lanceolata, plus minusve appressa, interioribus sublatis, herbaceo-membranacea, pallide viridia, margine membranaceo albido lato cincta, sub apice corniculis sat magnis saepe acutiusculis praedita, interiora oblongo-linearia, exterioribus longissimis plerumque duplo longiora, sub apice corniculis parvis obscuris donata. Flores pallide flavi, corollis subgalbris, marginales ligulis subtus stria obscura lata notatis: achenia pallide flavido-fusca, parte dilatata ca. 2.5 mm longa. sulcis longitudinalibus sat multis exarata, triente superiore sat parce muriculata, infra minutissime tantum aculeolata; pyramis ca. 0.5 mm longa; rostrum 1.5–2.5 mm longum: pappus 3.5–4 mm longus, plerumque vix fuscidulus. Fl. Junio-Julio.

Habitat in arenosis ac glareosis vallium fluminum et in angustiiis regionis montanae superioris.

Species Asiae Mediae (Pamiro-Alaj) endemica.

Typus. Montes Pamiro-Alaj, distr. olim Oschensis, vallis Alaicus, ad trajectum trans fl. Kysylsu 1 VII 1913, n° 702, O. Knorring; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

115. **T. pamiricum** Schischk. spec. nova.

Planta 2–10 cm alta; radix sat crassa, saepe multiceps, collo residuis atro-fuscis sat numerosis foliorum emortuorum vestito, in axillis plus minusve piloso; folia 2–5 cm longa, 3–9 mm lata, glabra, pro more integra, margine sinuato-dentata dentibus paucis (ab utroque latere 2–4), rarius subintegerrima vel pinnatilobata; scapi sub calathidiis laxe araneoso-tomentelli, in ceteris pimo plus minusve araneosi, dein plus minusve glabrescentes; involucri 8–12 mm longi phylla exteriora a lanceolato-ovatis ad late lanceolata, plus minusve appressa, interioribus sublata, atro-viridia, margine membranaceo albido lato cincta, ecorniculata vel subinconspicue corniculata; interiora oblongo-lineararia, exterioribus longissimis pro more duplo longiora, atro-viridia, sub apice corniculis parvis obscuris praedita vel ecorniculata. Flores flavi, corollis glabris vel subglabris, marginales ligulis subtus atro-striatis; achenia fuscescentia, parte dilatata ca 5 mm longa, in parte superiore parce brevissime tuberculata, sublevi, apice in pyramidem ca 0.5 mm longam sensim abeunte; rostrum 4–5 mm longum; pappus albus 4–5 mm longus. Fl. Julio-Augusto.

Habitat in pratulis, in glareosis regionis montanae superioris.

Species Asiae Mediae (Pamir) endemica.

Typus: Pamir orientalis, systema fl. Czecektinka, 4760 m. s. m. K. Stanjukovicz et. T. Kischkovskij; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

116. **T. seravschanicum** Schischk. spec. nova.

Planta 8–20 cm alta; radix sat crassa, collo residuis atro-fuscis foliorum emortuorum vestito, in axillis pilis flexuosis sat paucis praedito; folia 7–20 cm longa, 1.5–4.5 cm lata, subglabra, apice longe acuminata, runcinatim pinnatipartita, laciniis ab utroque latere 5–9 angustis longis, margine anteriore plus minusve dentatis, terminali parva, lacinulis et dentibus intermediis pro more sat numerosis; scapi sub clathidiis vix araneosi; involucri 13–20 mm longi viridis phylla exteriora a late ovatis ad late lanceolata laxa appressa, interioribus subaequilata vel sublata, herbaceo-membranacea, margine membranaceo albido lato cincta, sub apice corniculis sat magnis obtusiusculis praedita; interiora oblongo-lineararia, exterioribus longissimis 2.5–3-plo longiora apice obscuriora, corniculis sat magnis obtusiusculis praedita, Flores flavi, corollis in parte

media breviter pilosis; achenia pallide fusca, parte dilatata ca 4 mm longa, sulcis longitudinalibus paucis exarata, triente superiore sat longe muriculata, infra minutissime tantum aculeolata; pyramis 0.8–1 mm longa; rostrum in acheniis non sat maturis 4.5 mm longum serius ut videtur ad 7–9 mm longum: pappus 7–8 mm longus, albus. Fl. Junio-Julio.

Habitat in declivibus herbosis, in pratulis silvaticis, in Juniperetis.

Species Asiae Mediae jugi Zeravschanici endemica.

Typus: Jugum Zeravschanicum, Massarif-Ssaj 24 VII 1931, n° 413, S. Nikitin; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

CHONDRILLA L.

117. **Ch. laticoronata** Leonova spec. nova (sect. *Arthrorhynchus* Fisch. et Mey.)—Caules 35–100 cm alti inferene pubescentes tomentos-arachnoidei raro setulis dispersis praedit, paulo ramosi, ramis virgatis lucide viridibus; folia inferiora oblongo-lanceolata integerrima vel parum dissite erosa 3 cm long., 3–7 mm lat., cetera minora linearia, raro lanceolata, 1.5–2.5(5) cm long., 0.5–(13) mm lat. glabra vel araneosa, integerrima. Calathida fructificatione 12–15 mm long., pedunculis ca 7 mm long., floribus in numero 9–11; involucri phylla interna 10–13 mm long. dorso albo-tomentosa, venis medianis setulosa; achenia in parte dilatata 3.5–4.5 mm longa, superne squamis brevibus patulisque praedita (squamae interdum trilobatae); coronulae squamis quinque integris latisque, apice truncatis et erosulis vel rotundatis et late spatulatis formata; rostrum 1–2.5 mm long. crassum inferne articulatione a coronula limitatum; pappus 6–7 mm long. Fr. VII–IX.

Habitat in schistosis et in locis arenosis in vallibus fluminum Asiae Mediae.

Typus: In vicinitate urbis Alma-Ata (olim Vernyi) 15 IX 1885. 10 VIII 1887, J. Killoman; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. A *Ch. Rouillieri* Kar. et Kir. squamarum coronulae forma et rostri articulationis dispositione differt.

118. Sectio **Pachyrhynchus** Leonova sect. nova—Caules inferne albotomentosi setulis dispersis instructi; rosella in florescentia marcescens (ut videtur adest). Achenii pars dilatata 5–7 mm long.; rostrum crassum parte dilatata achenii paulo angustius, inferne dilatatum, non fragile, articulatione deficiente.

Sectionis typus: Ch. Kusnezovii Iljin.

119. **Ch. macrocarpa** Leonova spec. nova (subgen. *Brachyrhynchus* (Iljin) Leonova).—*Ch. ambigua* i, *crassicola* Iljin. in Byull. Otdel. Kauchukon. 3 (1930) 23 quoad ic., descr. excl.

Caulis 80–120 cm alt., 4–7 mm crassus, glaber divaricatum denseque ramosus, ramis flexuosis crasis glabris vel disperse pubescentibus, tantum superne i.e. in inflorescentia dense pubescentibus: folia infima mediaque runcinata, dentibus uno-tribus uno latere instructa. 0.5–5.5 cm long., 2–2.5 mm lat., folia cetera lineari-lanceolata integerrima 0.5–4 cm long., 755 0.5–2 mm lat. glabra vel disperse pubescentia. Calathida fructificatione 18–20 mm long. pedunculis dense araneoso-pubescentibus. quinqueflora: involucri phylla interna 13–15 mm long. dorso pubescentia, in numero 5: achenii pars dilatata (6.5) 8–11 mm long. squamis deficientibus vel superne tuberculis solitariis minutisque praedita: coronula deest vel vix conspicua: rostrum (0.2) 0.5–1.5 mm long. apice clavatum dilatatum pappus 8–9 mm long. Fr. VI–IX.

Habitat in arenis semideflatis Aasiae Mediae.

Typus: Desertum Kisyl-Kum prope fontem Kuldar dictum 20 IX 1932, Muravlianski: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. A *Ch. ambigua* Fisch. ex kar. et. Kir. foliis runcinatis, acheniis majoribus rostro elongato apice clavatum dilatato distinguitur.

120. **Ch. mujunkumensis** Iljin et Igolk. spec. nova (Subgen. *Brachyrhynchus* (Iljin) Leonova): b. Cob. oot. 6 (1935) 86, nomen; Iljin in Sborn. Kauchuk i Kauchukon. II (1953) 609 descr. ross.

Caules 75–120 cm alt., 5–9 mm crassi, inferne interdum rubescentes setulis brevibus dispersis instructi ab ima basi ramosi, ramis validis lucide viridibus, ramulis lateralibus dense arachnoideis: folia infima caulina lineari-lanceolata integerrima vel dentibus minutis praedita, interdum subruncinata ca 7 cm long., 4 cm lat., glabra, subtus venis setulis solitariis instructa; folia cetera linearia vel lanceolata 0.8–4.5 cm long., 1–2.5 mm lat. integerrima inferne uno latere setis 1–3 praedita, margine et subtus secus venas medianas interdum disperse setulosa, glabra vel sparse araneosa. Calathidia fructificatione 12–16 mm long. pedunculis dense tomentosis 5–7 mm long. floribus in numero 5–6(7–8); involucri phylla 10–13 mm long., dorso dense arachnoidea in numero 5–6(7); achenii pars dilatata 4.5–6 mm long. apice squamis trilobatis patulis uniseriatis et tuberculis uniseriatis praedita; coronula squamis 5 brevibus latisque trilobulatis formata; lobus squamae intermedius major; rostrum crassum 0.5–1 cm long. apice clavatum dilatatum; pappus 6–8 mm Fr. VI–IX.

Habitat in arenis Kasachstaniae orientalis.

Neotypus: Arena Mujunkum, prope stationem viae ferreae Akyrtoke 2 VII 1930, n° 199. G. Igolkin; in Herb. inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. A *Sh. Bosseana* Iljin, cui affinis, squamis coronuale latis brevibusque necnon rostro crasso differt.

CREPIS L.

121. *C. karakuschensis* Czer. sp. n. (sect. *Succisocrepis* Sch. Bip. ex. Bisch.)

756 Planta perennis, rhizomate brevi, 5–8(10) mm lt. verticali vel obliquo, radicibus tenuibus funaliformibus praedito, reliquiis atro-fuscis foliorum radicalium vetustorum vestito, simplici vel subramoso; caules in numero 1–2(3), 15–28 cm alt., erecti, striati, fistulosi, simplices vel parce ramosi, ramis lateralibus 1–2, aphylli vel foliati, foliis caulinis 1–2 parvis linearibus, virides, sub calathidiis vix incrassati, ut folia pilis plus minusve densis brevissimis glandulosis pallidis pubescentes; folia omnia radicalia, numerosa, (5)7–15 cm lg. (cum petiolo) et 0.6–2 cm lt. lanceolata vel oblanceolata, apice acuta, irregulariter sinuatodentata, dentibus anguste triangularibus acuminatis, petiolata, petiolis anguste alatis laminis aequilongis vel eis brevioribus. Calathidia in numero 1–2(3), erecta, plus minusve magna; involucri campanulatum, 12–16 mm lg. et 7–8(10) mm lt. (tempore florendi); involucri phylla extus pilis brevissimis glandulosis subbrunnescentibus et plus minusve longis setosis non glandulosis albido-flaveolis intermixtis dense tecta, margine tenuiter cilita, exteriora in numero 8, ovato-lanceolata, oblongo-lanceolata, iaequilonga, interioribus 1.5–2-plo breviora, interiora in numero 12–16, oblongo-lanceolata, acuta, aequilonga, membranaceo-marginata (intima), facie interiore glabra; receptaculum glabrum: flores flavi, involucri fere duplo longiores; florum corolla 13–17 mm lg., ligula ad 2 mm lt., tubo 4.5–6 mm lg., pilis tenuibus flexuosis pubescente; rami styli flavi; achenia immatura uniformia, viridulo-flavescentia, 7.5–8 mm lg. et 0.5–0.7 mm lt., fusiformia, subangustata, costulata (ut videtur costulis in numero 20), laevia, glabra; pappus 7–7.5 mm lg., albus, non deciduus. Fl. VI.

Habitat in declivibus lapidosis calcareis Transcaucasiae meridionalis.

Typus: Transcaucasia meridionalis, respublica autonoma Nachiczewan, distr. Nachiczewan, prope fontem Alma-Bulag in monte Karagut (Karakusch), ca. 1900 m s. m., in declivibus lapidosis calcareis, 11 VI 1947, fl. et fr. immat., A. Grossheim, I. Iljinskaja et. M. Kirpicznikov; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. Nostra species nova *C. albiflorae* Bab. affinis est. sed caulibus altioribus, pilis plus minusve densis brevissimis glandulosis pallidis pubescentibus, foliis radicalibus majoribus irregulariter sinuatodentatis, involucri phyllis extus pilis brevissimis glandulosis subbrunnescentibus et plus minusve longis setosis non glandulosis albido-flaveolis intermixtis dense tectis, involucri, floribus achenisque majoribus et pappo longiore differt.

122. *C. Alikeri* Tamamsch. sp. n. (sect. *Macropodes* Bab.).

Planta perennis, caudice brevi vulgo simplici, reliquiis fuscis foliorum vetustorum vestito; caules solitarii vel bini, 8–10 cm alt., graciles, erecti, recti vel subcurvati, rotundi, subsulcati, fistulosi, aphylli, griseolo-tomentosi et glandulosopilosi, pilis brevibus flaveolis rigidiusculis setaceis; folia omnia radicalia, numerosa, ad 7 cm lg. (cum petiolo) et 1.5–2 cm lt., oblongo-oblancoolata, pinnatisecta, segmentis triangularibus margine remote acuteque dentatis parvis, breviter petiolata, petiolis anguste alatis basi dilatatis, supra griseolo-viridia, tomentella. subtus griseolo-tomentosa; segmenta foliorum sicut dentes segmentorum apice rigide mucronulata, margine pilis non densis brevibus flaveolis eglandulosis rigidiusculis setaceis instructa. Calathidia solitaria, erecta: involucri campanulatum 12–13 mm lg. et ca 8 mm lt. (tempore florendi): involucri phylla oblongo-lanceolata, acuminata, extus appresse griseolo-tomentella, exteriora appressa vel subreflexa, inaequilonga, non marginata, interioribus duplo breviora, interiora latiora, aequilonga, angustissime membranaceo-marginata, extus in parte media pilis brevissimis nigrescentibus glandulosis rigidis setaceis tecta. apice albo-ciliata. facie interiore appresse pilosa: 757 flores pallide rosei (in sicco), involucri duplo longiores: corolla 20–22 mm lg., ligula 2.5–3 mm lt., tubo 6–7 mm lg., pilis raris minimis conicis pubescente: rami styli flavi: achenia immatura: pappus 8–10 mm lg., albus. Fl. VII.

Habitat in schistosis in regione alpina Transcaucasiae orientalis (mons Kjapaz).

Typus. Azerbaidzhania. olim prov. Elisabetpolis (nunc Kirovabad). mons Kjapaz. declivitas australis, 9000–10000 ped. s. m., 13 VII 1909, fl., A. Schelkownikow; in Herb. Inst. Bot. Ac. Sc. in URSS in Leningrad conservatur.

Affinitas. A proxima *C. Willdenowii* Czer. floribus pallide roseis majoribus, foliis supra griseolo-viridibus parce pubescentibus, foliorum segmentis margine pilis haud densis rigidiusculis setaceis praeditis differt.

123. *C. karelinii* M. Pop. et. Schischk. ex Czer. sp. n. (sect. *Ixeridopsis* Bab.) - *C. nana* var. *laxa* Kryl. Fl. Alt. III (1904) 763 and Fl. Zap. Sib. XI, 3044. - *C. pygmaea* auct. p. p. non L.: B. Fedtsch. Rast. Turk. Typk. (1915) 765. - *C. nan* ssp. *typica* Bab. in Univ. Calif Publ. Bot. 22 (1947) 540 p. min. p. (The Genus *Crepis*, 2). - *Youngia pygmaea* Y. *dentata* Ldb. Fl. Ross. II, 2 (1846) 838; O. and B. Fedtsch. Perech. Rast. Turk. IV, 350, pro var. - *Y. pygmaea* var. *lyrata* auct. non Ldb.: O. and B. Fedtsch. op. cit. (1911) 350. - *Y. pygmaea* var. *caulescens* Rupr. in Osten-Sacken et Rupr. Sert. tiansch. (1869) 59; O. and B. Fedtsch. op. cit. 350. - *Y. pygmaea* auct. non Ldb.: Kavalevskaya in Fl. Uzb. VI (1962) 498, excl. syn.

Planta glabra, glaucescens; radix elongata, tenuis, verticalis, apice in rhizoma breve, 1.5–4 mm lt. verticale, ramosum, rarius simplex, lignosum

abiens; caules non numerosi, 4–10 cm alt., rotundi, striati, haud fistulosi, a medio vel fere a basi ramosi, ramis tenuibus, foliati; folia radicalia et inferiora caulina 2–4 cm lg. (cum petiolo) et 0.5–1.5(2) cm lt., oblanceolata. elliptica vel oblongo-oblanceolata (raro obovata), apice acutiuscula vel obtusa, remote denticulata, irregulariter sinuato-dentata, lyrato-vel pinnatilobata, interdum subpinnatifida vel integerrima, vulgo in petiolum tenuem, laminae aequilongum, ea subbreuiorem, rarius longiorem sensim attenuata, media caulina 1.5–5 cm lg., radicalibus et inferioribus caulinis similia vel ut superiora caulina anguste oblanceolata vel lineari-lanceolata, apice acuta vel acutiuscula, integerrima, breviter petiolata vel sessilia. Calathidia 9–10-flora, pedunculata, pedunculis tenuibus subcurvatis 0.5–2.5 cm lg., in inflorescentiam corymbiformem laxam aggregata; involucri cylindraco-campanulatum, 8(10)–13 mm lg. et 3–4 mm lt. (tempore florendi): involucri phylla exteriora in numero 4–5, inaequilonga, ovata vel ovato-lanceolata, acuta, non membranaceo-marginata, interioribus, 5–8-plo breviora, interiora in numero 8, aequilonga, lineari-oblonga, acutiuscula, membranaceo-marginata (intima), subcarinata, non corniculata, apice crispe pilosa, facie interiore glabra; receptaculum glabrum; flores flavi, interdum praecociter pallide erubescens, involucri 1.5-plo longiores: corolla 11–14 mm lg., ligula ad 2(2.5) mm lt., tubo 3.5–4 lg., glabro vel pilis brevissimis conicis parce tecto: rami styli flavi: achenia uniformia, flavida, 4.5–8 mm lg. et ca. 0.5 mm lt, fusiformia, superne subangustata vel brevissime rostriformia, apice subdilatata, costulata, costulis in numero 10 rotundatis acute scabris (sub lente!); pappus (6) 7–9 mm lg., albus, non deciduus, Fl. VII–VIII.

Habitat in morenis et glareosis fluvialibus in alpinis.

Typus: Kasachstania, Alatau Transiliensis, flumen Czilik, in glareosis Togustau, 21 VIII 1934, fr. M. Popov: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. Nostra species nova *C. nanae* Richardson et. *C. alaicae* Krasch. affinis est, sed a prima caulibus inferne laxius foliatis, foliis in petiolum brevioribus sensim attenuatis, inflorescentia laxa, involucri et floribus majoribus, involucri phyllis exterioribus latioribus et pappo longiore, a secunda caulibus ramis tenuioribus, foliorum forma et divisione, petiolis longioribus et angustioribus et pappo longiore differt.

124. *C. caucasigena* Czer. sp. n. (sect. *Intybellioides* Froel.).

Planta perennis, rhizomate brevi obliquo, radicibus numerosis tenuibus praedito; caulis 40–70 cm alt. sat crassus vel subtenuis, erectus, costato-sulcatus, cavitatus, apice breviter ramosus, non foliatus, raro supra medium folio caulino uno valde diminuto lineari instructus, ut folia pilis plus minusve densis vel sparsis (praecipue folia) brevissimis albidis eglandulosis squarrosis subcurvatis vel subcrispatis rigidiusculis pubescens, superne

breviter glanduloso-pilosus; folia omnia radicalia, 6–20(25) cm lg. (cum petiolo) et. 1.5–4 cm lt., tenuia, oblongo-ovata, saepius oblongo-oblancheolata vel suboblongata, raro partim oblancheolata (tum acuta vel breviter acuminata), apice vulgo obtusa, margine inconspicue denticulata vel subsinuato-dentata, denticulis remotis obtusis, interdum integerrima, petiolata, petiolis brevibus alatis, Calathidia inflorescentiam racemosam vel racemoso-paniculatam formantia, breviter pedunculata. pedunculis gracilibus. pilis plus minusve numerosis brevissimis brunneolis glandulosis rigidiusculis tectis, sublanatis: involucrium breviter cylindraceum, (9) 10–12 mm lg. et. 3.5–5(6) mm lt.: involucri phylla extus breviter glanduloso-pilosiuscula, atro-virentia, facie interiore glabra, exteriora in numero 8–10, imbricata appressa, inaequilonga, oblonga, oblongo-lanceolata vulgo obtusiuscula, margine ciliatula, non marginata, interioribus triplo breviora, interiora in numero 11–13, aequilonga, lineari-lanceolata, acutiuscula vel acuta, integerrima, anguste membranaceo-marginata, apice albo-ciliata, fructificatione dorso anguste carinata, basi vix, incrassata et indurata; receptaculum punctatum, glabrum; flores lucide flavi, involucrio sublongiores; florum corolla 12–15 mm lg., ligula ad 2.5 mm lt., tubo 3–4 mm lg., pilis plus minusve longis hyalinis tenuibus dense pubescente; rami styli flavi: achenia uniformia, brunnea, 5–6 mm lg. et 0.5–0.7 mm lt., teretiuscula, fusiformia, recta vel subcurvata, costulata, costulis in numero 20 angustis rotundatis sublaevibus: pappus 5.5–6 mm lg., albus. Fl. VI–VII.

Habitat in pratis subalpinis et pinetis in regione superiore montana caucasicae (praecipue Caucasi centralis) et Daghestaniae.

759 Typus: Caucasus centralis, Balkaria. ripa Sinistra fluminis Rtyzvaschka, pag. Mamai-Kjunnjum, in betuletis in saxis, 2020 m s. m. 29 VI 1925, fl., n° 12. E. et N. Busch: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. A. *C. praemorsa* (L.) Tausch pedunculis et involucri phyllis breviter glanduloso-pilosis, acheniis majoribus sublaevibus, pappo longiore et areà geographica bene differt.

125. *C. astrachanica* Stev. ex. Zer. sp. n. (sect. *Mesophylion* Bab.)-*C. tectorum* auct. fl. ross. p. min. p. -*C. tectorum* ssp. *astrachanica* Krasch. in Fl. Yugo-Vost. VI (1936) 474, descr. rossica.

Planta annua; caules plus minusve numerosi, 5–15(25) cm alt., arcuatim ascendentes, rarius partim decumbentes, tenues, fistulosi, a medio vel a basi ramosi, foliati, virides, appresse subaraneosi, leves, saepe superne subaculeolati; folia levia, glabra vel parce araneoso-pilosa, radicalia 2.5–7(10) cm lg. (cum petiolo) et 0.4–1.5(2.5) cm lt., lanceolata, oblancheolata vel lanceolato-linearia, apice acuta vel acutiuscula, irregulariter sinuato-dentata, pinnatilobata vel lyrato-pinnatipartita,

brevissime petiolata, non marcescentia, caulina linearia, apice breviter acuminata, integerrima, sessilia, haud auriculata vel subauriculata. Calathidia multiflora, in inflorescentiam corymbiformem laxam aggregata; involucri anguste campanulatum, 6–7(8) mm lg. et 3–5 mm lt., virescens; involucri phylla extus griseolo-subaraneosa, interdum dorso pilis raris brevibus pallidis eglandulosis setosis tecta, exteriora in numero 5–8, linearia, acuta, inaequilonga, non marginata, interioribus triplo breviora, interiora in numero 12–14, oblongo-lanceolata, acuminata, aequilonga, late membranaceo-marginata (intima), facie interiore appresse pilosa; receptaculum ciliatulum; flores flavi; florum corolla 7–10 mm lg., ligula ad 1.5(2) mm lt., tubo 2–3 mm lg., pilis brevissimis rigidis sparse pubescente; rami styli viriduli vel flavidi; achenia uniformia, atro rubello-brunnea, 3–5 mm lg. et 0.4–0.5 mm lt., fusiformia, costulata, costulis in numero 10 angustis rotundatis, pilis minimis (sub lente!) rigidis tectis; pappus 4–4.5 mm lg., albus, non deciduus. Fl. VI–VIII(IX).

Habitat ad ripas fluminum et lacuum dulcium in regione austro-orientali partis europaeae URSS, Daghestania et Transcaucasia orientali (urb. Baku).

Typus: Astrachan, 1818, Steven: in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. Valde affinis *C. tectorum* L. s. str., sed caulibus plus minusve numerosis humilibus tenuibus a medio vel a basi ramosis, foliis caulinis subauriculatis vel haud auriculatis, calathidiis vix minoribus, involucri phyllis extus griseolo-subaraneosis, interdum dorso pilis raris eglandulosis setosis tectis, corolla breviora et styli ramis viridulis vel flavidis differt.

LAGOSERIS M. B.

126. *L. robusta* Czer. sp n. (subgen. *Lagoseris*).

760 Planta perennis, rhizomate lignoso obliquo vel horizontali, radicibus non numerosis funaliformibus praedito; caudex brevis, ad 2 cm lg., simplex vel bi-triceps reliquis atro-fuscis foliorum radicalium vetustorum vestitus; caues in. numero 1–3(8), 30–50 cm alt., crassiusculi, erecti, recti vel leviter flexuosi, teretes, tenuiter sulcati, superne, rarius ad medium subramosi, sparse araneosopilosi; folia rosulata, numerosa, crassiuscula, 4–13 cm lg. (cum petiolo) et 1.5–4 cm lt., oblongo-oblancoolata, apice acuta vel acutiuscula, profunde runcinato-pinnatifida, laciniis pinnatilobatis vel irregulariter et acute dentatis plus minusve latis, breviter petiolata, petiolis anguste alatis basi dilatatis et vulgo pallide purpureis, utrinque leviter araneoso-pilosa, sublanato-araneosa. interdum subglabra: folia caulina minima, linearia, bracteiformia, non numerosa. Calathidia, pedunculata, pedunculis crassiusculis; involucri anguste campanulatum

ca. 12 mm lg. et 6–8 mm lt. (tempore florendi); involucri phylla appresse griseolo-araneosa. exteriora in numero 10–12, biserialia, valde inaequilonga, non membranaceo-marginata, interiora in numero 14–16, membranaceo-marginata (intima), nigrescenti-viridia; flores roseolo-purpurei; corolla 15–16 mm lg., tubo ca. 4 mm lg.: remi styli virides; achenia uniformia, atro-brunnea, 6–6.5 mm lg., et 0.7–0.8 mm lt., costulata, costulis in numero 10, pilis densis minimis lucidis rigidis tectis; pappus 4.5–5 mm lg. Fl. VI–VII.

Habitat in declivibus lapidosis in Tauria meridionali.

Typus: Tauria meridionalis, inter montem Aj-Petri et flumen Uczan-Ssu, in declivibus lapidosis, 27 VI 1912, fl., S. Ganeschin; in Herb. Inst. Bot. Ac. Sc. URSS in Leningrad conservatur.

Affinitas. Nostra species nova. *L. purpureae* (Willd.) Boiss. praemontanae et *L. callicephalae* Juz. jailicolae affinis est, sed a prima habitu robustiore, caulibus altioribus, foliis plus minusve magnis subaraneosis vel subglabris, involucris, floribus et acheniis majoribus, a secunda, pedunculis appresse griseolo-araneosis (nec dense glanduloso-setoso-pilosis) differt.

nominum specierum atque synonymorum plantarum
in tomo XXIX Florae URSS commemoratarum

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